

Sinking a Shaft by Bridge-Foundation Methods. See pp. 273-276

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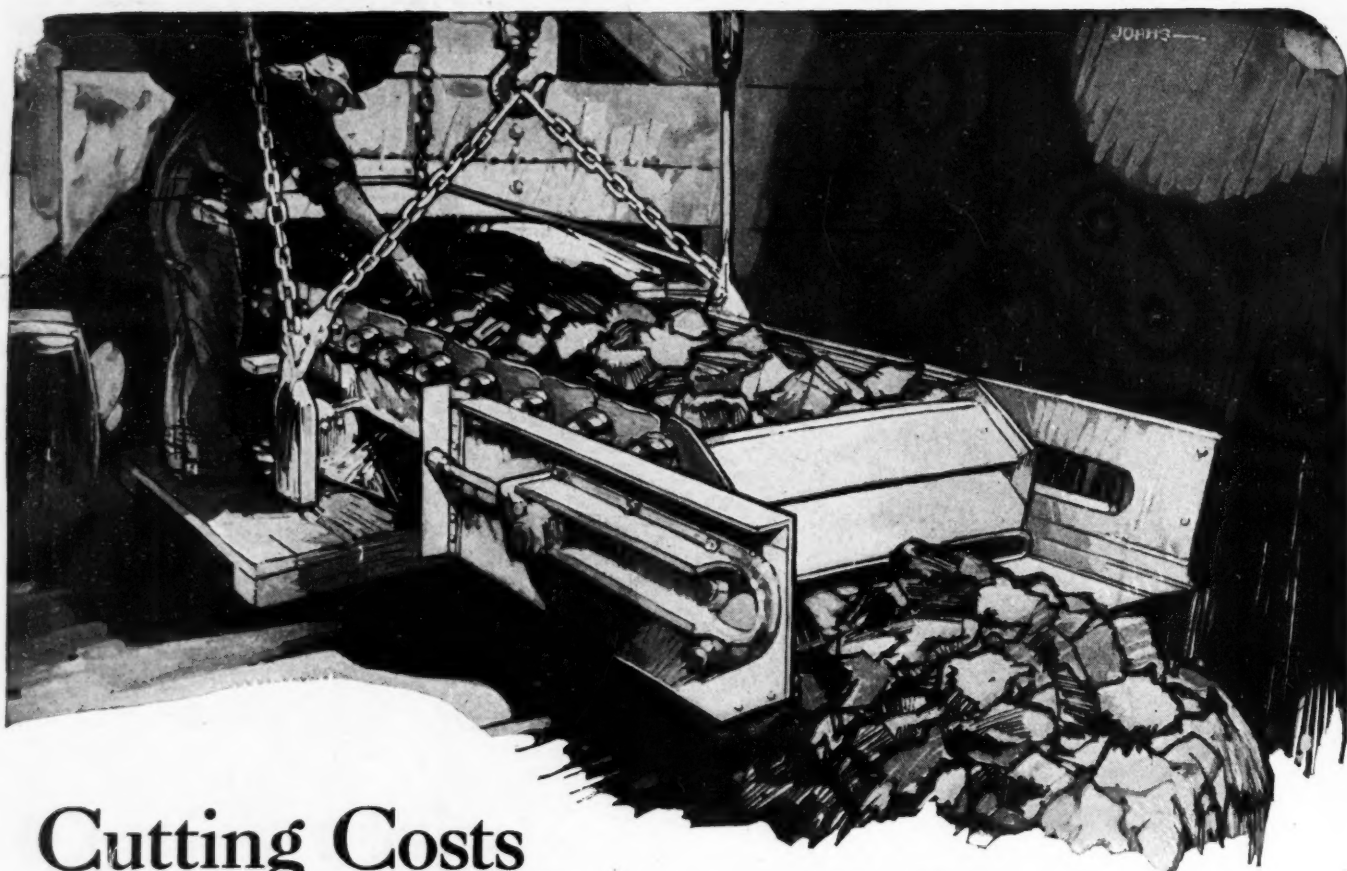


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# COAL AGE

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C. E. LESHER, Editor

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Number 8

## The Deadlock Broken

NEGOTIATIONS between the anthracite operators and miners were at a standstill for three weeks. The Coal Commission called both sides to New York and in three days got the wheels in motion again. That summarizes the situation, but it does not tell the story.

On July 26 John L. Lewis told the conferees, in session at Atlantic City since July 6, that unless the miners' demand for the adoption of the "principle of complete recognition and the check-off" be granted at once negotiations would be terminated. The operators the following day refused and the party broke up.

In the time that intervened until the Commission called them to New York the country has been wondering what it was all about and has been calling loudly for the government at Washington to do something. The press was petulant toward both parties but was beginning to say that the union was going too far in depriving the country of coal just because the operators would not collect its dues for it.

Whatever it was that Mr. Lewis and his advisers had expected would happen as a result of their surprising stand did not come to pass. They were losing ground at home and gaining none with the public. Back in the mining regions the men and their wives could get up no enthusiasm over another strike, and for such a cause. Lewis' famous luck was failing and the breaks were going against him.

Last week the Coal Commission took a hand. It asked the two interests to meet with it—not together but separately. It maintained a position of fact finding. No attempt at mediation, no effort to suggest that this or that would be a good way to settle the matter. The Commission wanted to know what it was and why that kept the parties from completing their negotiations and preventing a strike. The Commission announced that it was going to keep its fingers out of the machinery; would write no contract. It was after the big "why," and would report back to President Coolidge. He might tell the people.

Lewis opened the proceedings with two proposals, one stating the conditions under which he would drop the demand for the check-off, the other providing for keeping it. The second was impossible, and maybe he thought the operators would not accept his first. He was in a jam over the check-off issue and was hard after some way to drop it and save his face. The operators accepted his proposal to drop the check-off all around. They agreed to take cash for what the miners bought from them instead of deducting it from their pay.

That would not do at all. It would be most unpopular in the region. So over night Lewis did the Houdini act none too gracefully and squirmed out. He had to.

Two days gone, leaving the Commission "frankly discouraged" and but little wiser, the public gratified one morning with "No Strike" headlines and perplexed

the next with "Danger Not Averted." What was going on was that negotiations had been resumed with every move a public note with all that that implies—one thought for result and two for effect. To have pursued that course would soon have involved the Commission in the negotiations.

The Coal Commission held and still holds the trump card. Both sides know that whatever they may hold to be the facts, if and when the Commission states its opinion its position will come pretty near being the last word with the country. So, when on the morning of the third day the Commission asked them to report by night whether it was not possible to resume negotiations, they lost no time in announcing that negotiations would be resumed almost at once. Not a word about the check-off; that is dropped for the time being.

Matters are back where they were on July 26, when Lewis issued his ultimatum. Nothing has been gained save delay, a provoked public, and a feather in the cap of the Coal Commission.

## The Unfair Assigned Car

THERE seems to be no end to the argument over the assigned car. The Interstate Commerce Commission having disposed of it, the beneficiaries of the condemned practice arise en masse saying that there must be some mistake and ask for a rehearing and re-argument of their case. The Interstate Commerce Commission must answer them one way or the other soon.

The essence of the matter is that the use of the assigned car is unfair. It is unfair because it gives to a few consumers a great advantage in point of regularity and assurance of supply of coal and, not quite incidentally, an advantage in price. It is unfair because it gives to a few producers a larger proportion of transportation service than to the remainder and at a time when transportation service is the most valuable thing they desire.

The case with respect to the private car hangs on the same principle. The title to these cars rests with a consumer or producer and not with the railroad. The owner may say where these cars shall be placed and where transported. But because of this control he may not concentrate his cars at one mine in such manner as to give that mine better running time than other mines similarly situated. Transportation service as a whole must be equitably divided among the mines, and cars are but a part of that service. Motive power, trackage and all other facilities are involved. The Interstate Commerce Commission has decreed that private cars may not be used on an assigned basis because they thereby absorb an unfair amount of the limited transportation service afforded.

The arguments of the railroads and others for the assigned car consist mainly in assertions that they are better served thereby and do not see how they can get

along without the privilege. Nor, apparently, will they find a way until they have to.

It is no solution for the problems of intermittent operation and overdevelopment of the bituminous-coal industry to regulate it through the railroads. That was tried at the beginning of war control and signally failed. Abolition of the assigned car in all its forms makes for freer and more openly competitive conditions in soft coal—the condition contains the cure within itself.

### *Justice Takes Sides*

CRITICS frequently, and with cause, have questioned the symbolic correctness of the blindfolded figure of justice on our court houses. Justice, say they, is never blind and if she is she should be deprived of her sword. Justice is not impartial; she takes sides—after determining the right. She is not blind but of keen sight. Blindness and impartiality are not attributes of justice, and what is more they do not make for peace. So long as justice is blindfold and visionless what is left for contending parties but to fight? It is solely because justice is able to see and takes action according to her vision that we have peace. We shall never have peace if justice takes the position that a quarrel is something about which she should have no opinion, that all quarrels are private and that quarrelers are all of a sort and that bad.

When the war commenced that was the attitude the American public took. Some, it is true, said merely that it was not our quarrel, but others judged the quarreling itself was wrong and said that France as a quarreler was no better than Germany, another quarreler. At a first-aid meet in the anthracite region a learned judge told his hearers that the United States was superior to the nations of Europe (including France, Belgium and Great Britain) because while his auditors were busy in the preparation for rendering first aid, Europe was busy preparing for slaughter.

The war kept on, nevertheless, no matter how much we reprobated and deplored it, because the United States did not see fit to take sides. The judge of whom we have spoken had been taking sides daily in the settling of the affairs brought before him. The judge's decisions were a power for peace, but entirely forgetting that he gave advice to his auditors at that first-aid meet, which was of a kind that, being so frequent here, prevented action that would have caused a discontinuance of the war.

The public is like the judge in his first-aid speech and like the symbolic figure of justice over the court house. It says in the present controversy that the miners and operators probably are alike to blame. It refuses to take sides. It prides itself on its colorless opinion. It is not really interested to inquire who is right. It has gone only so far as to declare that the difference should be settled. How it should be settled is none of its business. So the disagreement goes on and will go on till the dominant factor, the public, decides who is right or until one of the quarrelers is more badly stricken than the other, and has to give way, right or wrong.

The public cannot avoid its responsibility. It cannot take the attitude that it is not the public's business who is right. The public can keep out of the matter as the United States kept out the war, but if it does so it must be content to see the disagreement go on. So long as it says a quarrel is a quarrel and

that both sides are to blame, it is necessary for it to wait until one side beats down the other, and it cannot complain if the rounds last too long or are too many.

*Coal Age* is not much in favor of official interference. Wages are determined unsatisfactorily by arbitration. It is difficult to tell which wage is right. But if it is too hard for the public to tell, it is surely a difficult problem for prejudiced parties. It is natural they quarrel. If the issues are indeed undeterminable and unjustifiable, let the public make up its mind that this dispute is a natural and not a vicious one on either part and if the quarrel is not of that character let the public take a hand at ending it. But to say there should be no quarrel is to say that the millennium should be reached in which every one will see with the eye of his neighbor, and to say that there should be no inquiry as to who is right but that both should be condemned is to make provision for a winter with no anthracite on the market.

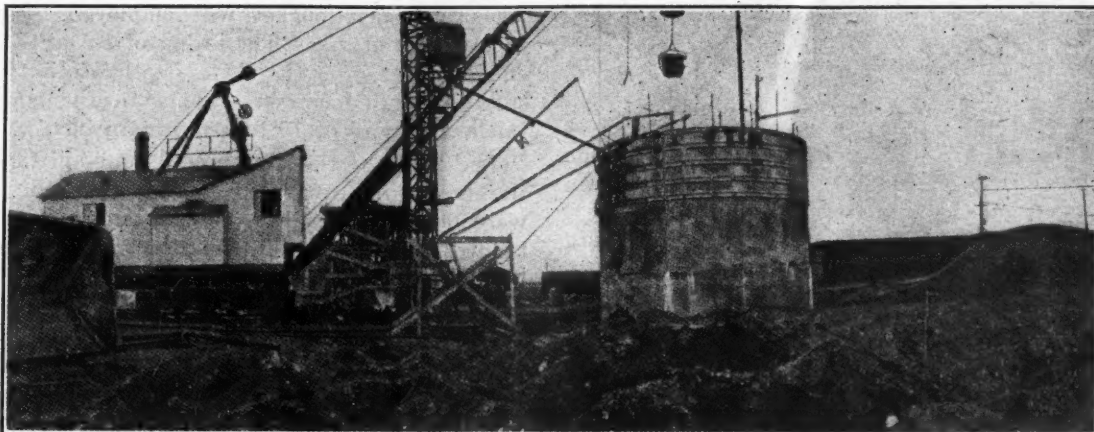
Even without executive action a well informed public with fixed notions as to the right could do much to prevent a strike or end one speedily should it be started. But so long as it has no notions about the matter, it is as futile as was the United States subsequent to its declaration of neutrality of mind and deed and prior to its entry into the war. Only Mr. Ford believed the reprobation of both parties would have a favorable effect. It is at least debatable whether the war would have been prosecuted by Germany if Americans even without being aggressive had been as positive then as they are today that Germany did wrong to invade Belgium and France and had protested accordingly.

All this is said because of the ridiculous editorials of the daily press and in view of the announced intention of the New England consumers to punish both parties by a boycott. Despite all their knowledge of the conditions the dailies steadily proclaim that to stand up for one's rights is criminal and shows an indifference to the public interest. The press boldly proclaims that it knows nothing and wants to know nothing, except that both miners and operators delight in quarreling, profit by it, rejoice in it as we declared the Allies and all Europe did up to and until the day we declared war on Germany.

So long as the princes condemn both Capulet and Montague for quarreling and make self-defense against aggression a crime, setting up no tribunal to discover the aggressor, so long will there be brawls in the street and the city will be "profaned" with "steel." Our American public refuses to give judgment either as to criminal or civil dissension. It is neutral, negative and therefore powerless. This is not the stand of justice. Justice takes sides or it ceases to be justice and becomes a feeble poltroon.

Commissioner Marshall is reported to have said "What the public wants is justice to both sides and plenty of coal. Anything that can be done will be done, but the thing we are not going to do is to write their contracts for them." The last statement means that the public does not want to dispense justice but intends to satisfy itself with demanding peace. The pleasure loving and badly stricken Mercutio may be excused for saying on the spur of the moment, "A plague o' both your houses," but it is not the function of princes or the public to deliver a ban that so completely overlooks justice and makes necessary the private arbitrament which it so freely condemns.





Main or Hoisting Shaft of Grasselli Chemical Co., Terre Haute, Ind., Under Construction

## In Sinking Spelterville Shafts Through Wet Sand Sizes Are Increased to Offset List of Caisson

Many Shafts in District Have Crooked Guides and Are Not Successfully Sealed Against Water—Pressure in Spelterville Caisson Reached Limit of Human Endurance—Listing Prevented by “Kickers” and Blocking

BY ALPHONSE F. BROSKY

Assistant Editor, *Coal Age*, Pittsburgh, Pa.

WHEN shafts have to be sunk in loose water-bearing soils the unfavorable conditions frequently seriously interfere with a close adherence to specifications, making changes necessary in the design of the shaft and modifying the methods by which it was at first proposed to sink it. To provide against difficulties in the sinking of shafts, boreholes should be drilled and their records carefully studied in the light of previous experience. Such a study will enable the shaft sinker to anticipate his problems and to prepare to solve them, but at best the difficulties may be so many and so perplexing as to tax the resourcefulness of men who are well experienced in the art of sinking in loose water-bearing strata.

When the Grasselli Chemical Co., in 1921, opened up its Spelterville mine in the No. 4 coal seam, five miles north of Terre Haute, Ind., and awarded the contract for the sinking of two shafts to the Dravo Contracting Co., of Pittsburgh, Pa., that firm decided to forecast to the best of its ability the difficulties that might arise, and to plan expedients for every emergency. Accordingly, a study was made by this company of the shaft-sinking methods that had been employed at mines in the vicinity of the properly. However, most of these mines are in the Clinton district to the north of Spelterville and on the west side of the Wabash River, where in most cases the shafts were sunk in timber by the open method, no serious difficulty being encountered.

In a few instances steel jacking plates, followed by skin-to-skin timber sets, were employed. In a number of cases, however, the shafts were not plumb when finished, and in others it was impossible to shut off the

water at the rock because of the methods employed. After inspecting the timber lining in these shafts and noting the unsatisfactory performance of the hoisting cages consequent on the crookedness of the guides, the contracting company concluded to employ pneumatic caissons in sinking the shafts of the Spelterville mine.

Boreholes on the site of the auxiliary shaft showed a bed of sand and gravel 140 ft. thick that overlaid solid rock in which a permanent seal could be made. Of this thickness 111 ft. was water-bearing. Boreholes at the location of the main shaft revealed that it would be necessary to sink through 160 ft. of sand and gravel and that 105 ft. of this thickness was wet.



FIG. 1—REINFORCING RODS AND LUBRICATING PIPES IN AUXILIARY SHAFT

One block is in position and is ready for the placing of forms for the next block. The eight so-called lubricating pipes emit water, steam or air and loosen the sand and gravel around the caisson, thus enabling the shell to slide down more freely than if the material were packed around it.

NOTE—In the headpiece the pile of sand on the right is an accumulation from the blowpipes. It represents the sand and gravel which occupied 48 ft. of the shaft excavation.

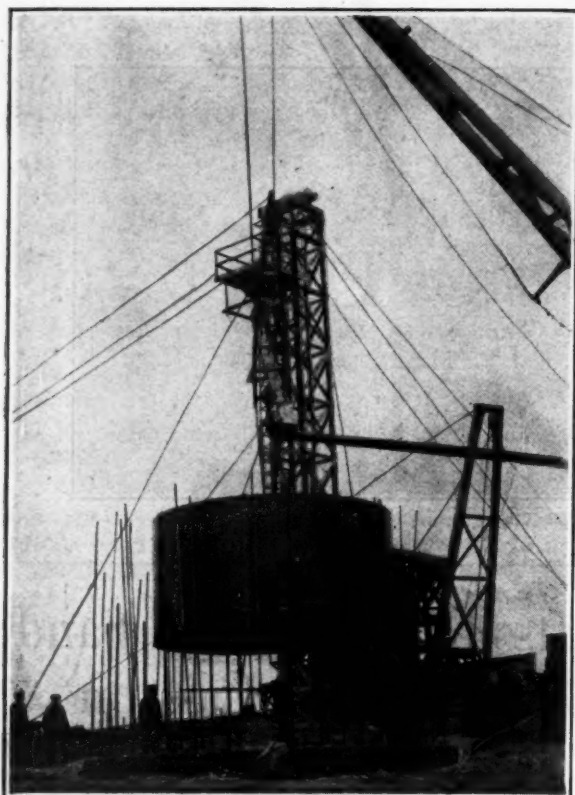


FIG. 2—PLACING INSIDE FORM AT AUXILIARY SHAFT

The forms are built on the ground and placed by a derrick. As soon as the outer and inner forms have been set and secured, concrete is poured from the tower in the rear.

Hydrographs of the Wabash River were studied, and the hydraulic gradients at various stages were plotted. Data on other water problems also were carefully considered.

Finally it was decided that pneumatic caissons would successfully penetrate this sand and gravel but that a pressure of 51.5 lb. per square inch would be required in the working chamber to overcome the hydrostatic head at these depths. Though two shafts had to be sunk the construction program permitted the sinking of one shaft at a time, so that the compression machinery used for the auxiliary shaft could be used for the sinking of the main shaft as soon as the former had been sealed at the rock.

An inside diameter of 13.5 ft. with a concrete lining of 18 in. was specified by the coal company for the auxiliary shaft. Profiting by the experience of those in the vicinity whose shafts, when completed, were out of plumb, the contracting company planned to sink this shaft with a diameter of 16 ft. on the inside, thus allowing a clearance of 15 in. all around.

Incidentally, this provision was a wise one in that the shell was out of plumb but within the clearance when the shoe was finally sunk to a footing of solid rock. As the caisson walls were 4 ft. thick, the outside diameter of the shell was 24 ft. Steel rods, placed horizontally and vertically, were used to reinforce the shell, which also was fitted with lubricating pipes at eight equidistant points in its periphery to lubricate the outside surface with water, steam or air, injected under pressure from the top of the shell. In the course of sinking the shaft lining these pipes were used frequently to reduce the skin friction and thus insure an even downward motion with the cutting edge at times crowding the diggings.

From the top elevation of 491 ft. the shaft was sunk by the open method to an elevation of 458 ft., a depth

of 33 ft. below the surface, at which stage the concrete deck was put on at a height of 35 ft. above the shoe. An orange-peel bucket was employed to remove the excavated material. The lining of concrete was lengthened in lifts of 8 ft. At a depth of 58 ft. below the surface, equipment was added to furnish air at an initial pressure of 16 lb. per square inch.

The crews worked in three 8-hour shifts. Whenever the materials excavated were sand and gravel they were blown out in 6-in. blowpipes. Where the caisson tended to stick, the skin friction was reduced by means of the lubricating pipes.

The buoyant effect of the high air pressure coupled with the lack of resistance of the fine sand through which the caisson was sunk caused the latter to be unstable and difficult to control. It was badly out of line just before it reached the rock, and in consequence much labor was spent to land within the clearance of 15 in. allowed all around.

At the surface "kickers" were used on the low side between the soil and the lining, and diametrically opposite an excavation was made with the orange-peel bucket from the surface to the upper water level. On the inside a system of blocking was placed under the shoe to retard the downward movement of the low side.

When the shell landed on a coal seam 22 in. thick which lies above a bed of fireclay next to the rock the lining was 10½ in. out of plumb. Moreover, it was discovered that the bottom of the shoe leaned in the direction of the dip of the coal, but not to the same degree. The dip, in fact, amounted to 12 in. in a length equal to the outside diameter of the caisson. Taking into account the difference in levels of the high and low side of the shoe, the low side hung at a height of 10½ in. above the coal, yet was slanting with the dip nevertheless.

Because the coal seam dipped in a direction that hindered rather than aided in obtaining an even bearing, the 10½-in. gap on the low side of the shoe was blocked up and the coal was dug out under the high side of the shoe. Thus the shoe was adjusted to an even bearing without disturbing the alignment of the shaft. The process of dropping the caisson through the coal to the fireclay was essentially slow because it became necessary

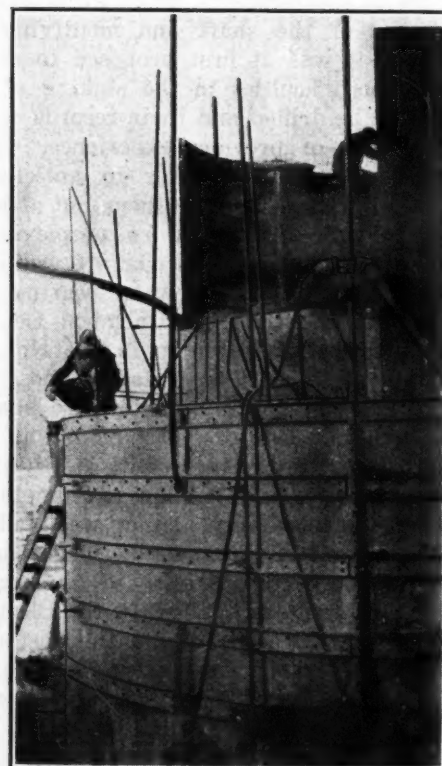


FIG. 3—BLOWING DRY SAND FROM AUXILIARY SHAFT

At one stage in the operations dry sand was raised from the working chamber to the surface, through a 4-in. pipe, the air having a pressure of 1½ lb. per sq.in. It was found that it was easier to bring the sand up when dry than when wet.



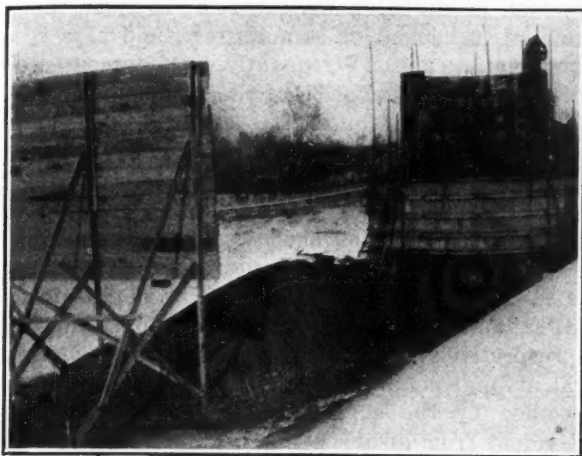


FIG. 4—ANOTHER VIEW OF BLOWPIPE IN ACTION

The shoe was at this point 79 ft. below the top of the concrete. A hoarding has been erected to precipitate the material blown from the pipes.

to "lock out" the coal in buckets as it was dug. At this level the shifts were changed every half hour, as the men were working under pressures of from 49 to 51 lb. per square inch, nearly three and one-half atmospheres. After much effort the caisson finally was leveled up in the fireclay, and preparations were then made to drop it to the rock. By this time the shell had become very light.

After numerous "blow-downs," or reductions in pressure, were made within the air chamber the shell finally landed evenly on an elevation of 353.5 ft., which was the horizon to which the excavation had been squared up in the fireclay. Each "blow-down" was accompanied by an inrush of sand and water; in some cases as much as fifty bucketfuls had to be removed between successive attempts to drop the shell to its final resting place.

No difficulty was experienced in caulking the shoe, which was accomplished by the use of oakum and an unusually stiff grout. The rock was excavated  $2\frac{1}{2}$  ft. lower than the shoe, and in it forms were placed for the first half of the seal. Concrete was poured and then held in place under a pressure of 51 lb. per square inch for four days to allow it to set sufficiently.

After the compressor was stopped and the air was gradually cut down to normal, it was found that the hole made 13 gal. of water per minute, which, it was felt, could be closed off in the second seal. At bedrock the hydrostatic head was 115.65 ft., equivalent theoretically to a pressure of 50.2 lb. per square inch. The maximum air pressure carried in this work, as before mentioned, was 51.5 lb.

Upon completion of the first seal in the auxiliary shaft the air equipment was removed. Excavation proceeded in the open in preparation for the second seal which extended in solid sandstone for a depth of 2 ft. below the level at which the first seal was made. The leakage of 13 gallons per minute which found its way through the first seal was closed off almost entirely by the second seal, as was proved by closing the stop cocks on the grout pipes placed in the wall. Grouting through these pipes was the last step in the highly successful undertaking of sealing the shaft. The time required for the work to this point was about five months.

A detailed account of the work of sinking the main shaft is unnecessary inasmuch as many of the difficulties encountered have been already described in relation

to the auxiliary shaft. Similar methods were employed in the sinking of both shafts. Work on the main shaft had been going on for nearly two months simultaneously with the work being done on the auxiliary shaft, and the two jobs were so nicely scheduled that the main shaft was ready for the use of the air equipment at the time the auxiliary shaft was first sealed. The specifications provided that the finished shaft should have an inside diameter of 18 ft.

It was sunk, however, with an inside diameter greater than that specified by the coal company, namely 20 ft. This gave a clearance of 12 in. all around, which was less than that allowed in the sinking of the auxiliary shaft. The contracting company felt sure that the main shaft would not show a list beyond the limits allowed, reasoning that the smaller shaft when it landed on the rock was off less than 12 in., and that the crews, being more familiar with the conditions to be met, would be able to sink the second shaft more accurately.

From a surface elevation of 519 ft. the shaft was sunk to an elevation of 428 ft. before the caisson deck was installed and preparations were made for pneumatic sinking. A massive sandstone which pitched slightly was reached at an elevation of 362 ft. This was squared up and penetrated for a depth of 10 in. to form a footing for the shoe.

When sealed the leakage amounted to no more than two gallons per minute. The maximum working pressure in the air chamber to counteract the final hydrostatic head of 105 ft., or 45.5 lb. per square inch, was 47.5 lb. This pressure, by the way, was increased to 49 lb. while concrete was being placed.

As one might well realize, no little difficulty was experienced in sinking the shell so that it would land on the solid rock within the limit of 12 in., which was the maximum displacement allowed. As in the sinking

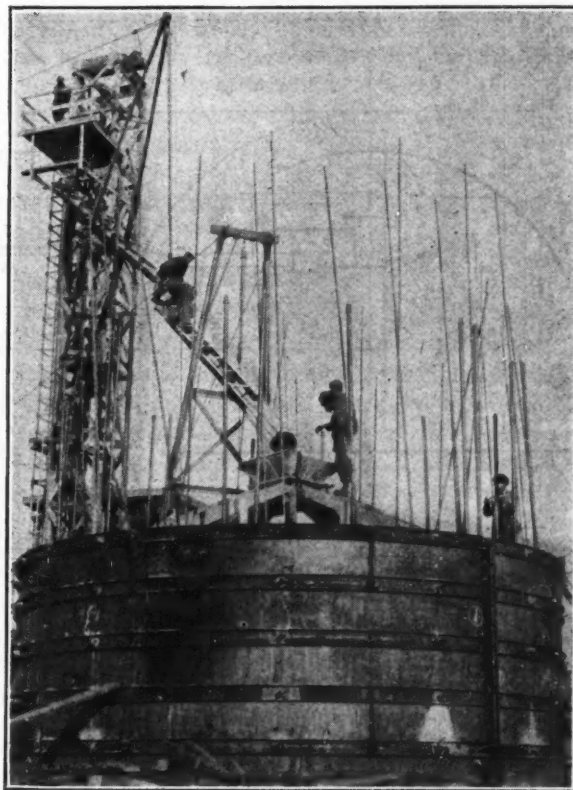


FIG. 5—POURING CONCRETE INTO EIGHT FOOT FORM

The shaft is only just started, this being only the second block to be poured, no air being used at this stage of the operations.

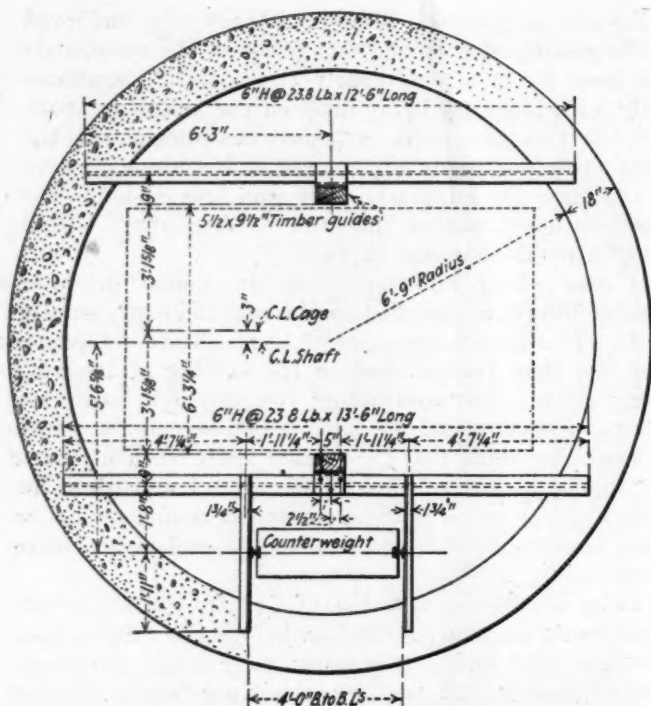


FIG. 6—CROSS-SECTIONAL PLAN OF AUXILIARY SHAFT

This shaft is only 13 ft. 6 in. in internal diameter. It is intended to accommodate a single counterweighted cage. The center line of the cage is 3 in. south of the center line of the shaft. In consequence the southern buntion is 12 in. shorter than the other.

of the auxiliary shaft, the caisson naturally was difficult to control by reason of its deck, which had an area of 616 sq.ft. and was 35 ft. above the shoe. The bottom of the shell was not at any time really fixed, due to the buoyancy of the air chamber.

Consequently when the top listed from the vertical, the caisson was righted only with great difficulty. In fine sand and in the presence of water the skin fric-

tion, which is slight enough at best, is made less by the upward movement of escaping air, and as a result the pneumatic caisson frequently flounders. Closest attention to the manipulation of the blocks on the inside and "kickers" on the outside is essential to keep the caisson erect. With each "blown-down" the "kickers" were adjusted, and the top, which at one time leaned 24 in. out of plumb, was "kicked back" to within 10 in. of being plumb when the shell was finally landed.

No further trouble was encountered in extending the shafts to the No. 4 seam of coal. The depths to coal are 181 ft. and 197 ft. for the auxiliary shaft and main shaft respectively. Figs. 6 and 7 show in plan the general arrangements of compartments in both shafts as specified by the engineers for the coal company. As is evident from an inspection of Fig. 7, the ultimate capacity of this mine is not meant to be large, or a single counterweighted skip would not have been selected. This provision though unusual is in accord with good engineering practice.

The success of this shaft-sinking job emphasizes distinctly the need of forethought in putting down shafts through alluvial deposits and soft ground. In spite of all that is known of the technique of shaft sinking, many failures in this work have been reported and many shafts have been sunk at undue cost.

As a rule shafts cannot be made too large, but in many cases they are constructed too small. Had these shafts in Indiana been sunk to correspond with the exact needs for the hoisting equipment, they would when they were completed, unless irregularities in the guides had been tolerated, have had a plumb diameter about 2 ft. less than that specified.

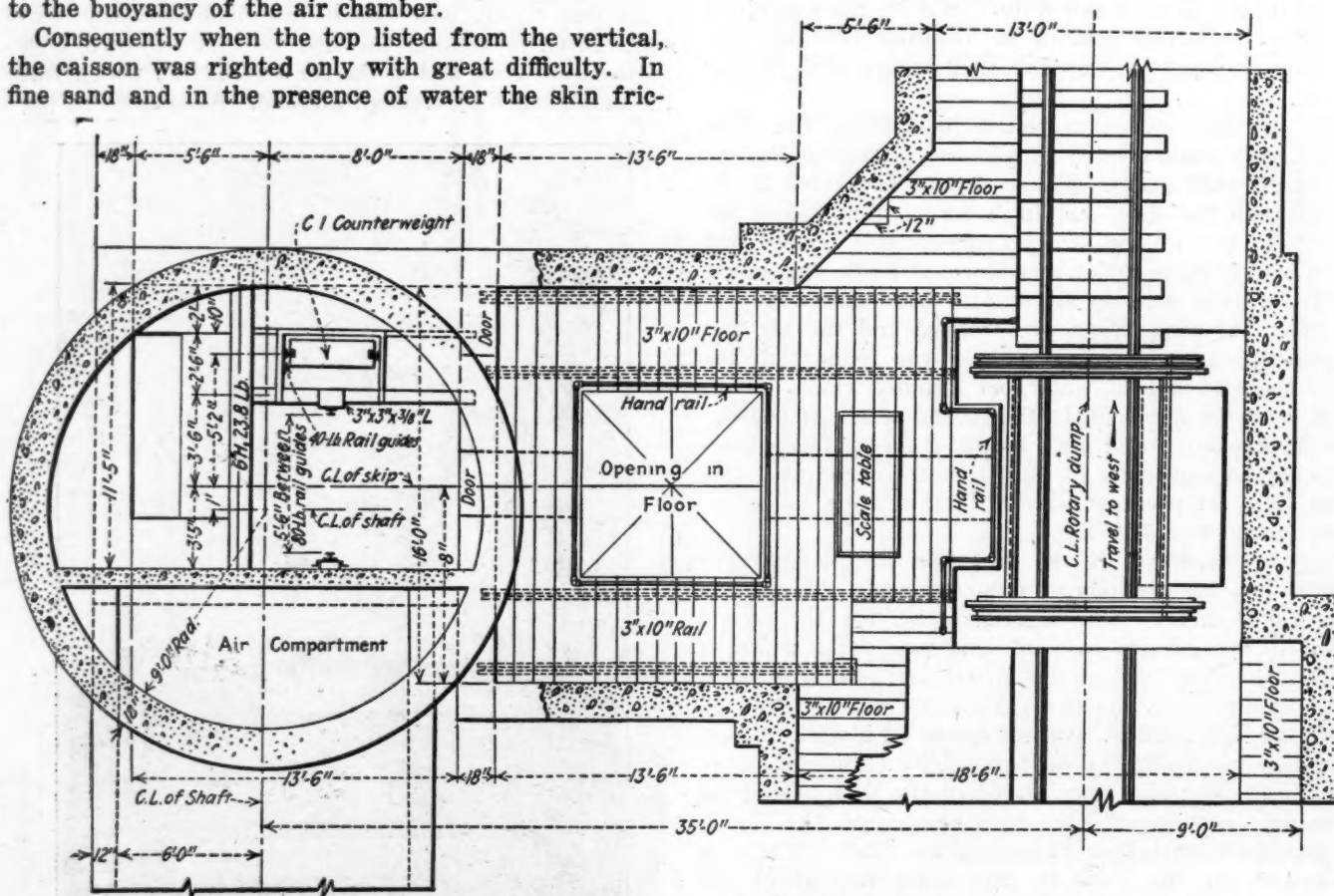


FIG. 7—CROSS-SECTIONAL PLAN OF FOOT OF MAIN SHAFT SHOWING ROTARY DUMP

The shaft has a segmental air compartment which is formed by the introduction of a concrete partition. The counterweight is placed on the opposite side. A buntion is placed at right angles to this partition between it and the shaft wall, and this in turn supports another buntion placed parallel to the partition. The skip guides are placed on this wall and on the second buntion.



## Can Expel Water from Wet Slack by Oils and Pressure; Much Ash Leaves the Coal with the Water

Use Only Three to Ten per Cent of Oil for Flocculation—Addition of Oil and Pressure of One Ton per Square Inch Reduces Water in Pulp from 130 to 10 per Cent of Solids—Coal Briquets Well Without Further Drying

By C. H. S. TUPHOLME  
London, England

**T**WO important developments have recently been made in rendering the concentrates from the froth-flotation system of coal washing more suitable for industrial purposes. It is obvious, from a study of the froth-flotation process, that the resultant concentrates are finely divided coal particles mixed with a large quantity of water, and it is naturally essential that these concentrates should be at least substantially separated from the water with which they are originally in such close association. After conducting a number of investigations, Minerals Separations, Ltd., the operators of a froth-flotation method, have discovered two ways to separate the coal particles from the associated water.

In the first method the froth flotation concentrates or other powdered coal particles associated with water are suspended in sufficient water to make a mobile pulp. This pulp is then subjected to agitation, usually with aeration. To this is added an oil, tar or some other hydrocarbon or carbonaceous liquid, which has the property of coating the coal particles and also of causing the coal particles coated, to flocculate together, after which the coated and flocculated particles are separated from the water by draining or filtration without being compressed into blocks or briquets.

It has been found that certain oils, tars and other hydrocarbons or carbonaceous liquids, which are incapable of forming briquets of carbonaceous materials, possess these coating and flocculating properties.

### NEED BUT LITTLE FLOCCULATING MATERIAL

It has also been determined that this flocculating effect occurs with very small quantities of these agents when in water. The quantities of the reagents may be small, (from 3 to 10 per cent of the weight of the coal, for example) sufficient only to coat the coal particles with a fine film like a varnish, and a quantity quite insufficient to fill the interstitial spaces between the particles.

The flocculated particles include in the interstitial spaces a large proportion of water, but owing to the fact that their surfaces have become repellant to the water, it is possible to remove the contained water by filtration or draining, preferably assisted by pressure, and thus the drying of the particles becomes a simple matter.

It may be said here that Minerals Separations, Ltd., makes no claim to the use of the Trent process where coal particles are agitated with a quantity of liquid hydrocarbon up to 40 per cent of the coal to form an amalgam of the coal and oil with the exclusion of the water.

The removal of the water from the coated and flocculated particles may be assisted by pressure. However, it must be remembered that the coating and flocculating

agent does not act as a binder and therefore will not suffice as a binding medium in the manufacture of briquets.

This method offers particular advantages when the coal particles are subsequently to be made into coke, because the hydrocarbons in the flocculating agent are distilled in the coking operation and may therefore be recovered. Moreover, the presence of these hydrocarbons in the mass of the flocculated coal particles constitutes an addition of volatile matter which assists the coking of special types of coal, which would otherwise be unsuitable for the manufacture of coke.

The quantity of the agent employed is sufficient to produce the flocculation at the temperature of the circuit water. It may be reduced by using a heated circuit, but the treatment is better performed at atmospheric temperature. From 3 to 5 per cent has been found sufficient when anthracene oil, coal-tar, coal-tar oil and other reagents are used. The following are examples illustrating the application of this process.

Coal from a Durham shaft mine was ground to pass a screen of 0.1 in. aperture. The ground coal was concentrated by flotation, using 0.5 lb. of creosol and 0.125 lb. of paraffin per ton of coal. The concentrates removed had a water-to-solid ratio of 1.3 to 1.

The concentrates with their associated water were placed in a vessel of square horizontal section, and were agitated by an impeller rotating with a peripheral velocity of about 600 ft. per minute. Coal tar from coke ovens was added during the agitation, the quantity of tar amounting to 4 per cent of the weight of the dry concentrates. The test was made at room temperature. The coal became intensely flocculated and readily separable from the water.

### PRESSURE AND LITTLE HEAT ALMOST DRIED COAL

The bulk of the water was removed by draining, but it would be assisted, if desired, by subjecting the flocculated coal to compression. Under a pressure of 2 tons per square inch, the coal became substantially free from water, and in drying it in a water oven at a temperature of 100 deg. C. for a period of 8½ hours, the weight diminished by 2.7 per cent, which indicates the small quantity of water remaining.

The coal was thus formed into a cake which, however, could be easily crumbled between the fingers. It will be understood that it is not essential to compress the coal into cakes in this way although this may be done both to assist removal of the water and to facilitate handling of the treated material.

In the second case, coal from the Powell Duffryn mines was ground to pass a screen with an aperture of 0.1 in. The coal was concentrated by flotation using ½ lb. of creosol and 0.5 lb. of paraffin per ton of coal, in which operation the ash content was reduced from

15 per cent to 5 per cent. The concentrates removed had a water-to-solid ratio of 1.35 to 1.

These concentrates with their associated water were transferred to a vessel, in which they were agitated as in the first example and during the agitation anthracene oil was added, the quantity of oil being 3 per cent of the weight of the dry concentrates. This operation was performed at room temperature. An intense flocculation was produced, and when some of the flocculated coal and water was placed on a 60-mesh screen, clear water ran through, and the greater part of the contained water drained away.

When the mixture of flocculated coal and water was placed in a mold having slits for the egress of the water and subjected to a pressure of 0.5 ton per square inch, some further water exuded, and a cake was formed which contained 12 per cent of water.

A pressure of 1 ton per square inch produced a cake containing 9 per cent of water. In either case the cake crumbled easily between the fingers.

When treating powdered coal not already concentrated to separate the coal particles completely from gangue or other ash-forming materials, it is possible to effect not only the flocculation of the coal particles and the removal of the water, but, also, in the same operation, it is possible to separate the gangue and other ash-forming materials from the coal particles.

Thus, in this method, the finely divided coal particles mixed with gangue or other ash-forming materials, are suspended in sufficient water to make a mobile pulp. This pulp is then subjected to vigorous agitation with a similar flocculating agent in a quantity insufficient to form an amalgam, in which the interstitial spaces between the particles are filled with the flocculating agent, but sufficient to coat the coal particles and flocculate them in water with the aid of the agitation.

The gangue particles are not coated or flocculated, but remain in suspension in the water, and are separated from the coal with the water by draining or filtration. The coal particles cling together in masses which will not pass the screen, and the gangue particles, being unflocculated, pass through in suspension in the water. The draining may be assisted by pressure, or not, but in any case durable briquets are not produced.

#### REDUCES ASH IN COAL FROM 23 TO 13 PER CENT

In another case waste coal or duff from the Powell Duffryn mine in South Wales and containing 23.04 per cent of ash was made up into a mobile pulp with an equal weight of water, and the pulp was agitated, a quantity of coal tar equal to 4.75 per cent of the weight of the crude coal being added so as to produce flocculation.

The mixture was then transferred to a press and subjected to a pressure of 2 tons to the square inch, thereby causing the water to exude. It carried a large proportion of the gangue away with it in suspension. The resulting cake contained only 13 per cent of ash and 5.56 per cent of moisture. This test was carried out at normal atmospheric temperature.

Again the process of flocculating the coal particles may be done in such a way that the coated or flocculated coal particles are floated in the form of a froth, while the gangue remains in the water.

The same material as in the previous example, viz.: pulverized waste coal or slack from the Powell Duffryn mine in South Wales, was mixed with its own weight of water to form a mobile pulp. To this pulp were

added the following reagents: 4.7 per cent of coal tar, 0.075 per cent of creosol and 0.075 per cent of paraffin oil, these percentages being based on the weight of the crude coal.

After agitation and aeration the flocculated coal was removed as a froth and subjected to a pressure of 2 tons to the square inch. The resulting cake contained only 5.76 per cent ash and 3.87 per cent of moisture. This test was carried out at normal temperature.

In the second method the coal is made readily separable from water and briquets easily prepared either from powdered coal or from the froth flotation concentrates by a cold process.

During investigations it was found that if pitch in a molten condition be mixed with naphthalene, the mixture remains liquid but viscous at ordinary temperatures. Very slight warming thoroughly melts it. This material was used as a binding agent, and in coating the coal particles with it they become readily separable from associated water and can be pressed into briquets.

In this process a mobile pulp of the coal and water is agitated with a binding agent consisting of pitch which contains naphthalene or phenanthrene so as to coat and flocculate the particles as in the previous method. On introducing the pulp into a press, also at normal atmospheric temperatures, and subjecting it to a pressure of 2 tons per square inch, an excellent briquet is produced, substantially free from moisture. The briquets are hard and durable, and become harder with time, and it is also found that naphthalene volatilizes out of them.

#### COAL, PITCH AND NAPHTHALENE QUICKLY HARDEN

In the course of investigations it was found that if naphthalene is mixed with molten pitch in the proportion of 1 part of naphthalene to 3 or 4 parts of pitch, the mixture remains liquid for a long time, but if powdered coal be added, solidification occurs after a short time.

It will be understood that this process is applicable to the briquetting of finely powdered coal from various sources, but it is particularly applicable to the production of briquets from coal concentrates produced by froth-flotation, these concentrates being already in admixture with water.

The following is a description by way of example of the application of this invention to the production of briquets from Powell Duffryn slack.

In one test 1,200 g. of Powell Duffryn slack in a finely divided state was treated by froth flotation, the agents added per ton of slack being  $\frac{3}{4}$  lb. of cresol and  $\frac{3}{4}$  lb. of paraffin. The froth removed contained 1,000 g. of coal in a pulp of 1.3 water to 1 of solid.

To this pulp was added the molten binding agent containing 5 per cent pitch and 2 per cent naphthalene, based on the weight of the coal, and the mixture was agitated, at normal atmospheric temperature under a pressure of 2 tons to the square inch. The water ran away clear from the flocculated material which formed an excellent briquet with a crushing strength of one ton per square inch. In place of naphthalene, phenanthrene may be used.

It will be understood that the expression "pitch" includes such substances as the pitch obtained from petroleum distillation. The expression "finely divided coal" includes all coal of the sizes dealt with in briquetting processes or in the flotation concentration of coal or mixtures of various grades suitable for such treatments.



## Why Artificial Lightning Is Produced

Study of Lightning Characteristics—Practicality of Power Transmission at Higher Voltages—Lightning Generator and Its Uses

**I**N THE production of high-voltage electricity approximating that of lightning, which has caused so much interest in scientific circles, the practical significance of the tests has to a certain extent been overlooked.



FIG. 1—LIGHTNING FLASH

The church steeple in a miniature village is shown here being struck by a 2,000,000-volt lightning bolt.

Man-made lightning is a phrase with which to conjure. Yet the Pittsfield engineers of the General Electric Co., who spent years of study in the production of these highest known artificial electric pressures, did not do so simply to produce a pretty picture of an electric arc or an artificial thunder storm. They had a very definite end in view, namely the devising of more improved methods for protecting electrical systems from the damaging effects of real lightning, particularly on long transmission lines carrying power.

Some of the things which mean much to the engineer in considering the phenomena of lightning were described at a meeting of the American Institute of Electrical Engineers by F. W. Peek, Jr., who conducted the recent spectacular tests, as follows:

"During a thunder storm lightning voltages that reach the transmission line, produce high electric strains across insulators, transformers and other apparatus at the extremely rapid rate of millions of volts per second. With this rapid rate of application the voltage may reach a very high value in a microsecond (millionth of a second). Hence since there is always a delay or lag in the breakdown of insulation, quite peculiar effects result from these voltages. For instance, some remarkable phenomena that take place are: Much higher lightning voltages usually are required to jump a given distance than voltages at normal operating frequencies; conductors at normal frequency voltages often are good insulators for lightning voltages; water may be punctured like oil; the wet and dry spark-over voltage of insulators are equal; the lightning discharge has a markedly explosive effect, etc. In addition to these characteristics a study also has been made of the

change in voltage and of the shape of a lightning wave as it travels over a transmission line at the velocity of light.

"In order that a laboratory study may be of practical as well as theoretical interest, it is necessary to be able to reproduce lightning voltages in the laboratory on a large scale and of known characteristics. This investigation was started some years ago with a 200-kv. generator. This generator has been added to from time to time until now 2,000,000 volts are available and some single lightning strokes can be obtained that increase at the rate of fifty million million volts per second. The power is of the order of millions of kilowatts. It is believed that this generator closely approximates the voltage and other conditions that usually occur on transmission lines. The lightning voltages used in the investigations were far in excess of any heretofore produced in a laboratory.

"Photographic studies have shown the lightning spark-over of insulator strings that are of such length as rarely to spark over in practice even in bad lightning country. The photographs of the flashes show all the characteristics of lightning, such as a zigzag path, side flashes and the like. These studies are of interest in that they indicate a certain protective which must or should be taken in practice. With such voltages and currents possible therefore it is practical to investigate the protective value of ground wires and lightning rods. It is such an investigation as this that is now under way.

"Along with the production of 2,000,000-volt lightning, further studies of our original production of high voltage at 60-cycle frequency have been continued.

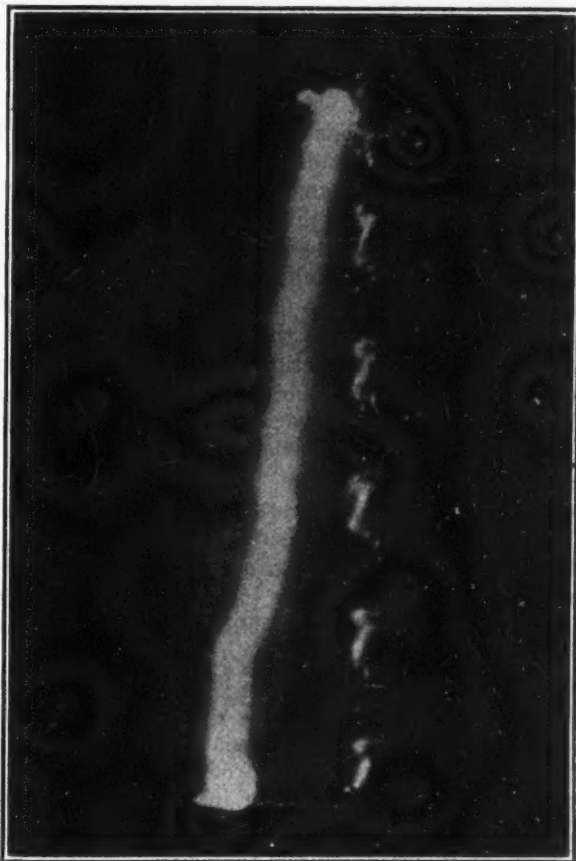


FIG. 2—INSULATOR TEST

Under storm conditions long strings of insulators may be tested. In this photograph the discharge has cleared the insulators. Note how the drops of water between the insulators have been illuminated.

Even if transmission at 1,000,000 volts is not definitely in sight at the present time, there are, of course, many uses for such high voltages in the laboratory from the standpoint of research. But it may not be out of place to indicate just what are the possible uses of 1,000,000 volts in practical transmission.

"On such a system the conductor probably would be about 6½ in. in diameter. If it is assumed that this is a hollow tube with copper equivalent to a 1-in. diameter rod it is possible to transmit 3,000,000 kw. 1,000 miles with about 12 per cent loss and 1,000,000 volts at each end. If 5-in. tubes were used there would be very little loss in fair weather, but during a rain storm the loss would be of the order of 1,000 kw. per mile.

"The striking fact that this brings out is the large amount of power necessary to make such a line economically desirable. It also emphasizes the enormous size of the apparatus units necessary. If present practice were followed, 1,000,000-kw. transformer units would be necessary. This probably would mean erecting in the field. The problem of size and transportation becomes greater than the problem of voltage. However, only a little over ten years ago the 200-kv. line was in a laboratory stage similar to the 1,000,000-volt line discussed here."

### Use Concentric All-Rubber-Covered Cables

By L. C. ILLSLEY\* AND H. B. FREEMAN†

**I**N CONNECTION with the approval of coal-cutting machines for service in gaseous mines the engineers of the U. S. Bureau of Mines have been somewhat concerned as to the type of trailing cables that could safely be used on permissible outfits. Though no final action has been taken on this question and tentative approvals have been granted pending investigations the Bureau has been endeavoring to collect data and information on this problem which would permit a fair yet safe ruling to be made.

For this purpose arrangements were made to visit certain of the mines of three coal companies in order that the cables and cutting machines could be observed in operation. In all twenty mines were visited. A questionnaire covering the operations of trailing cables was filled out at each of these mines. In a few instances no personal inspection was made, the information being supplied by mine officials after conferences with the Bureau's engineer. At other mines the information given by mine officials was supplemented by personal observation inside the mines, usually at a time when the cutting machines were in operation.

The points covered by this questionnaire and a digest of the replies to each are presented in the following summary: Fourteen of the mines used voltage from 500 to 550; the others from 250 to 275. The machines were chiefly of the shortwall type, although a few breast machines were in use. Two general types of cables, "twin" and "concentric," were being used. Most of the twin conductor was insulated with rubber and protected by an outer weatherproof braid. Most of the concentric cables were rubber-insulated and further protected by a special rubber outer covering. In many of the mines investigated the twin braid-covered cables were being replaced by the concentric, all-rubber insulated type.

The length of the cables varied from 200 to 500 ft., 250 and 300 ft. being the most usual lengths. The size of cable varied from No. 8 to No. 4, No. 6 for 500-volt and No. 4 for 250-volt being more commonly used. No reliable cost figures were obtained. In most mines the all-rubber protected type of cable had been in service only a few months, and no fair estimate could be made as to its ultimate life as compared with the cheaper braid-covered cables formerly in general use.

### ALL-RUBBER-COVERED CABLE OUTLASTS BRAIDED

The life of the braid-covered cable generally was given as 6 to 18 months; in one instance, however, a life of four months, and in another of three years was reported. In several mines the all-rubber-covered cable had been in service about two years and showed little wear. In general the cable of the latter type had not been in service long enough to permit an estimate of its life, but nearly everyone seemed satisfied with its wearing qualities during the time it had been in service and expressed a marked preference for it.

From a safety viewpoint some of the answers to the question, "When are cables discarded and by whose order?" are of interest; for example: "Cable is discarded when the tendency of the cable to blow up becomes too great;" "Cable is discarded when cable blows up too often." The electrician or machine boss usually is the man who decides whether a cable should be discarded.

A cable reel was used in all but one of the mines. In one mine no reel was used on breast machines. This mine reported the shortest cable life of any investigated. Cables deteriorate by being run over, by kinking, by rubbing against coal, etc. The braid-covered cable, especially, deteriorates from becoming water-soaked, also from kinking. Once the braid has become broken deterioration is quite rapid. Twin cables "kink," but concentric cables do not.

### INQUIRY DISCOVERS MANY CAREFUL MEN

A good machine man seldom runs his machine over a cable. For some mines the number of times a cable is run over was stated as "once a month," and for one mine the answer was "once a year." In one mine the cable reel was too small for the cable, and the cable was run over "once a week."

Cables usually are repaired by the electrician or machine boss and splices are made by the machinemen. Practically all repairs are made inside the mine. In several mines special splicing clips were used, but knots and Western Union splice were used in many cases. In all cases the splices were taped. No difficulty had been experienced in splicing cables except in one mine that reported the concentric cable as being difficult to splice. The repairs to the all-rubber-covered concentric type of cable were very much less frequent than those to the twin braid-covered conductor.

The voltage regulation was reported as not good in two mines, fair in five mines, and good in the remainder. It generally takes from 15 to 30 minutes to make a cut. One mine reported 5 minutes to sump, 15 minutes to cut, 10 minutes to unload and 5 minutes to load.

Several mines reported some heating of twin cable, but in general no trouble had been experienced with concentric all-rubber-covered cable, either on or off the reel. One mine reported heating of concentric cable

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†Junior electrical engineer, U. S. Bureau of Mines.



on the reel and said that the cable was cooled by pulling it off the reel. This heating evidently was due either to low voltage or to using too small a conductor for that particular service.

Usually either improvised or commercial hooks were used to attach the cable to the power supply. In a few mines clamps were used. In nearly every case a wood or fiber handle was provided to permit the operative to handle the hook without shock. In a few cases tape or a rubber hose served as protection.

In six mines the trailing cable was protected by a fuse, the fuse generally being placed in the insulated handle of the hook. About the same quality of cable was used for the hand cable as for the reel cable, the tendency being toward the concentric all-rubber-covered type of cable. In mines having water the twin braid-covered cables were seriously affected by wet conditions, but no trouble had been experienced with all-rubber-covered concentric cables.

At a previous conference of representatives of these industries and of the Bureau, it was suggested that the Bureau devise tests to determine the suitability of cables for service in gaseous mines. The data obtained in this field investigation would seem to make such tests, especially on any considerable scale, unnecessary, as in almost every instance the concentric all-rubber-covered type of cable proved to be the safer.

Summed up, such cables have a longer life, require less repairs, do not kink, do not become water-soaked, can be handled with less liability of shock to the machine operative and are gradually replacing the older type of twin conductor which has an outer protection of weatherproof braid.

It is believed that for use on permissible outfits where a high degree of safety is desired, the Bureau would be justified in rejecting cables so constructed that they have a tendency to kink or that are so insulated that they have a comparatively short life.

## Magazine Explodes in Drumheller, Alberta

ABOUT 1,000 lb. of black blasting powder and 200 lb. of high explosives are believed to have been in the blast that completely destroyed a powder magazine at the Gibson Colliery, Drumheller, Alta. It is believed that two workmen, W. McKinnie and H. Rees, went to the magazine for powder, one of them with an open light. Fig. 1 shows all that was left on the scene after the explosion occurred. The magazine was a small drift into the hillside about 100 ft. in the hill. Other illus-

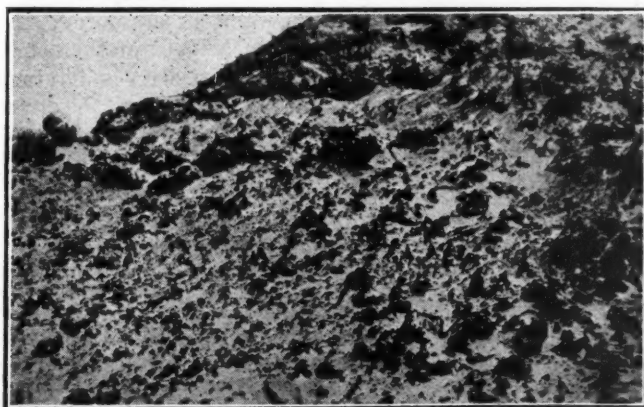


FIG. 1—RUINS OF THE MAGAZINE AFTER EXPLOSION  
The explosion killed both McKinnie and Rees, who probably were in the magazine at the time.

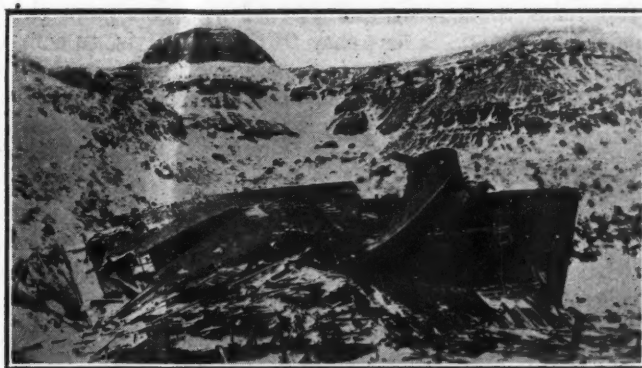


FIG. 2—WASH HOUSE 300 FT. FROM MAGAZINE

J. B. Scott and H. L. Jones, who were in the wash house at the time of the explosion, escaped with bruises, Scott having a contusion over the left eye and Jones on the side of the face.

trations show the Gibson surface plant and what was left of the wash house after the explosion. One cannot favor the use of an underground magazine, for it is almost necessary to use a light when entering it. No light should be allowed in a powder magazine. All illumination should be exterior—that of the sun or of an

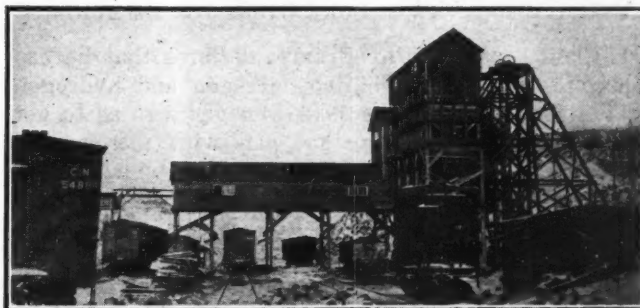


FIG. 3—SURFACE PLANT OF GIBSON COLLIERY

Plant has a capacity of 1,000 tons per day. The coal in the seam worked, No. 5, is 4 ft. thick and the cover runs from 60 to 200 ft. The headframe of the shaft can be seen on the right. The hoisting frame was moved about 6 in. by explosion.

outside electric lamp. The risks run at mining plants are frequently altogether unnecessary and occasionally even criminal. Instances such as this add force to the plea for more care in planning powder houses. The company probably believed that it had a safe powder magazine—well back in the hill. The explosion showed the irony of its belief!

## Can Ammonia Be Made, as Well as Saved, from Coke-Oven Gas?

FROM the time of the first recovery of byproducts from the coal in the coke oven, the aim has been to get if possible all the ammonia the gas contains and perhaps still better all the nitrogen as ammonia that is contained in the coal. As there is but little nitrogen in coal the greatest expectation of ammonia output bears only a trifling ratio to the tonnage of coal coked; thus with nitrogen comprising 1.5 per cent of the coal weight which is a big percentage the quantity of ammonia that it might possibly be converted into by combination with hydrogen would be 1.82 per cent.

Assuming that we get 25 lb. of sulphate of ammonia from a net ton of coal, we get 6.58 lb. of ammonia or about 0.329 per cent, roughly  $\frac{1}{3}$  or  $\frac{1}{4}$  of what might be hoped for. The nitrogen of the coal evidently does not appear in any large measure as ammonia in the coke-oven gas. About three times as much is obtained in the manufacture of producer gas by the Mond process.

It is easy to get any quantity of nitrogen from the atmosphere, but it is less easy to fix it, that is, to combine it with something else to form something for which we have a use such as with carbon to form cyanogen or with hydrogen to form ammonia. However, it is now found possible to combine nitrogen with free hydrogen. Now, free hydrogen can be made from water, but when it is obtained it is in admixture with oxygen and ready to combine explosively with it to form water. It is, however, a large constituent of coke-oven gas. It forms about 5 per cent of the weight of many dry coals, whereas the nitrogen content is barely 1.5 per cent.

Moreover hydrogen goes further in the manufacture of ammonia than nitrogen, weight for weight, and that is what we are considering. Three pounds of hydrogen are needed to make 17 lb. of ammonia, but 14 lb. of nitrogen must be supplied for that purpose. The advantages, therefore, of combining free hydrogen from coke-oven gas with free nitrogen from the air would seem great provided that the operation was not too expensive and the gas was not needed for fuel purposes as it usually is everywhere but at coal mines.

#### USES HYDROGEN FROM COKE OVENS FOR AMMONIA

M. Claude, a native of France, declares that he has such a process for combining nitrogen and hydrogen and that he can treat the coke-oven gases so as to get free hydrogen combining that gas with nitrogen to make synthetic ammonia. For the facts which follow we are indebted to *Chemical & Metallurgical Engineering*. M. Claude has succeeded in dissolving in ether under pressure most of the coke-oven gases and the volatilized liquids, thus leaving hydrogen as a residuum. Near the end of 1921, Claude at the Montereau works with the use of a simple apparatus of his designing succeeded in producing 230 cu.m. (9,122 cu.ft.) of hydrogen hourly from 300 cu.m. (10,595 cu.ft.) of water gas. He was able to use this hydrogen directly in his production of ammonia. This first apparatus has now been replaced by one having twice that capacity, and the present apparatus is supplying a plant producing 5 metric tons (5.51 short tons) of ammonia daily. The treatment of water gas was but an intermediate step toward the utilization of coke-oven gas.

Notwithstanding the small quantity of coke-oven gas heated (850 cu.m. or 30,018 cu.ft. per hour), the working pressure of the apparatus at the Béthune plant is somewhat under 24 atmospheres, or 353 lb. It is hoped that a pressure of below 15 atmospheres, or 220 lb. may be obtained with a new type of apparatus now being studied, which is designed to treat 5,000 cu.m. or 176,578 cu.ft. of gas per hour, equivalent to a daily production of 20 metric tons or 22.05 short tons of ammonia.

At Béthune, the gases treated are compressed on coming from the debenzolizing appliances, to a pressure of approximately 25 atmospheres, or 367 lb. The succeeding apparatus for treatment consists of a series of towers. In the first the gas comes in contact with a flow of heavy oil controlled by a small pump. Here any remnants of benzol still carried by the gas are scrubbed out. Thence the gases run into a second column, where they are decarbonated by means of a flow of lime water delivered by a centrifugal pump. The next stage in the process carries them to separators, where the water is taken out as well as any other condensable product.

Ethylene,  $C_2H_4$ , one of the most precious of these, can be recovered separately. The hydrogen taken out is then sent on to a gasometer, and the other gases carrying high methane contents are sent back to the works for utilization. So low is the cost of the hydrogen obtained as above described that it is possible in common practice to use the nitrogen produced in any one of the usual processes.

#### HALF THE BÉTHUNE GAS WAS CRUDE HYDROGEN

Below are given certain of the results obtained at the Béthune collieries. When 850 cu.m., or 30,018 cu.ft. of gas were treated per hour the quantity of hydrogen obtained was approximately 425 cu.m. or 15,009 cu.ft., per hour, or 50 per cent. This analyzed about 90 per cent pure hydrogen, 1.6 per cent carbon monoxide, and a remainder of approximately 9.4 per cent of nitrogen. Ammonia was produced at the rate of 150 kg., or 330.7 lb. per hour, of which 140 kg., or 308.6 lb., was in the liquid state.

The power required for this operation, including the heating of the tubes, debenzolizing and decarbonization, was approximately 460 kw. The physico-chemical method of decarbonization is to be replaced by a purely chemical method that will reduce the consumption of power below that of the present apparatus.

Claude claims for his process great simplicity, as well as low construction and labor costs. The fact that the gases are compressed for the purpose of recovering the hydrogen from them may be of advantage in carrying out the whole process of debenzolizing under pressure. The yield in benzol would then be increased by 10 to 15 per cent, while the size of the absorption and distillation appliances would be reduced. Naturally, the quantity of solvents or scrubbing oil and unavoidable losses and the consumption of steam, etc., would also diminish.

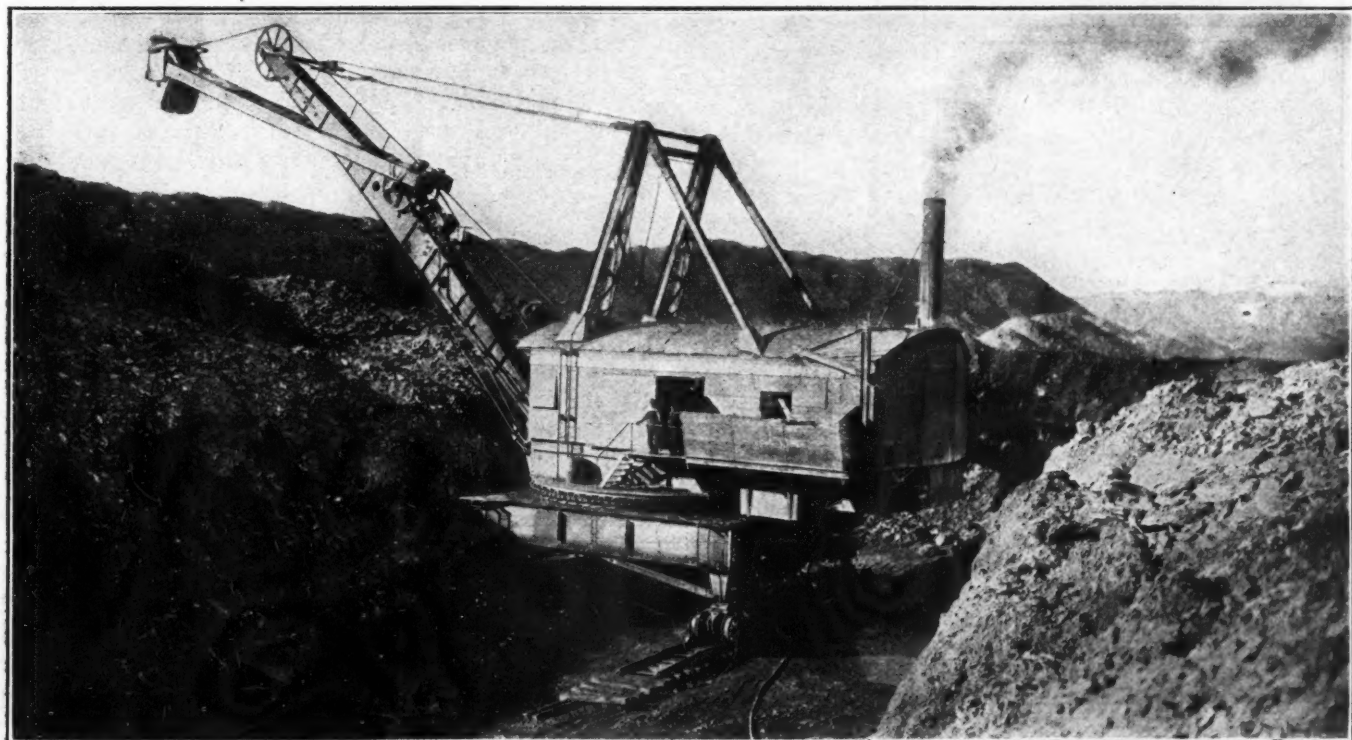
As the various component parts of the gases are recovered and can be used separately, it is likely that from 150 to 200 kg. (330.7 to 440.9 lb.) of ethyl alcohol will be produced per metric ton of ammonia. The increase of the yield of benzol and the production of ethylene are alone sufficient to make up for the cost of compressing the gases for the separation of hydrogen.

#### They Used to Scrape a Little Dirt in Kansas Strip Pits, But Now—

**B**ACK in 1898 when the Clemons Coal Co., Pittsburg, Kan., was young, the overburden was removed from the coal as shown in the top picture on the page following. Twenty feet was about the limit of stripping. In the illustration, Ira Clemens, now president of the company, is shown on the left in white shirt sleeves driving a scraper team. Today gigantic steam and electric shovels as big as any used anywhere move 50 ft. of overburden handling 4,000 to 6,000 cu.yd. a day with 6-yd. dippers working on an 80-ft. boom. They turn the flat country into regions of hills as can be seen in the lower picture of the opposing page. Today also strip-pit loaders almost dispense with hand shovels and "elbow grease." The type of loader shown in the center illustration follows the shovels and operates its  $1\frac{1}{2}$  cu.yd. dipper horizontally and thus can part coal along cleavage lines without cutting into the tough fireclay "horsebacks" which afflict Kansas operations. Mechanism has eliminated from stripping much of its hard, hot work.



Strip-Pit Operations in the Kansas Coal Fields Today and in Yesteryears



## Safety Switch at Slope Mouth Catches Runaway Cars

A Simple Precaution at the  
Mouth of the Dolomite Mine  
Would Have Prevented Explosion

**T**HAT for an expenditure of \$500 or less made once and for all, a majority of the runaways at slope mines with their trains of calamities to life and property, could be avoided is the opinion of A. J. Moorshead, president and general manager of the Madison Coal Corporation, Chicago, Ill.

A safety switch built on the slope, just outside the mouth of the tunnel, is the safety device upon which Mr. Moorshead pins his conviction. Such a switch with a short track running into an upgrade at the end could be used to catch runaway trips with such ease that it is a matter of wonder that this installation is not standard at every slope mine in the country. A bill is now before the State Legislature of Alabama making safety switches part of the required mine layout.

When Mr. Moorshead's company (a subsidiary of the Illinois Central R.R.) took over No. 11 mine, an eight per cent slope operation at DeKoven, in western Kentucky, he found upon inquiry that many runaways from the knuckle of the dump had occurred with nothing but the chance of a derailment to stop the trip from going to the bottom of the slope or to the face of the workings in the mine. Upon inquiry he found that many such runaways had taken place at DeKoven and that injuries had resulted therefrom, and he immediately directed that a safety switch be constructed near the month of the slope, as shown in the illustrations. This construction cost approximately \$500. Although there have been several runaways from the knuckle since that time, they have all passed to the safety switch, and no persons have been in-

jured nor property been damaged aside from the wrecking of a few cars.

No. 11 slope is approximately 6,000 ft. from dump to bottom. It is 500 ft. from the mouth of the slope to the knuckle. That distance is the most dangerous part of the entire haulage system. Most of the runaways start right at the knuckle after the trip has been hauled to the top, the rear car has been scotched and the cable has been detached so that the front cars can be uncoupled and run to the dump. When this is done the tail end of the trip may hang back over the end of the down grade to the dump and on the steep incline leading back into the mine.

Runaways are usually caused by careless spragging, which allows the trip to coast down into the mine, gaining momentum and the power to do frightful destruction with every turn of the wheels.

It is seldom that any very serious damage is done through the rope breaking or from any other cause when the trip is being pulled up the slope, because when thus being pulled a steel trailer is attached to the rear car and its crows-foot dragging along behind the trip is always ready to stop the train by digging into the ground or ties before any backward momentum is attained. The danger is much greater near the knuckle because it is here that the trailer is removed.

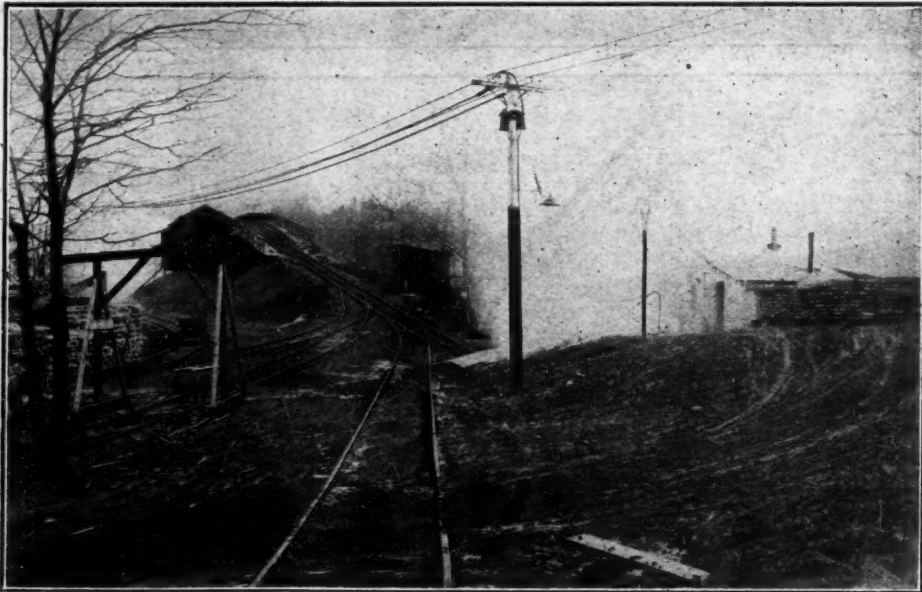
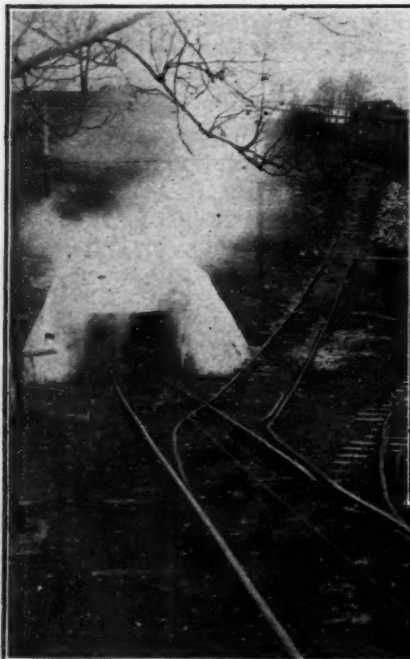
At No. 11 Mine, the trip rider on the rear car of outbound trips takes off his trailer at the mouth of the slope and throws the safety switch. He then waits right there for the next trip of empties going down, and as long as that switch is thrown no runaway cars can run back into the mine.

There are other precautions and safety devices in use at Mine No. 11, such as an automatic engine stop to prevent the hoist from pulling the trip through the tippie, but the "safety switch" is regarded as the most important protection the mine has against damage.

Following the terrific explosion of mine dust at the

Top of No. 11 Slope

Trip rider at switch, detaches  
trailer and sets safety switch.



Trips Take Sidetrack

The switch on the incline  
leads the trip up a steep hill  
slowing down its speed without  
damage.



Dolomite slope in the autumn of last year, in which more than seventy men lost their lives from a runaway trip which cut an electrical circuit, State Mine Inspector Nesbitt of Alabama had a bill introduced in the Alabama Legislature requiring safety switches at all slope mines, and a further bill providing that lines carrying electric current into mines be concealed. These requirements would tremendously increase the margin of safety in Alabama against a repetition of the Dolomite disaster.

In that unfortunate mine a runaway trip rushed down a rock slope 850 ft. long, pitching 30 per cent. The point of ignition was about 100 ft. from the bottom. There the cars smashed an armored cable, causing an inside contact which blew through the armored covering. This not only produced the spark which ignited the dust in the slope, but stopped the main fan for about twelve minutes until auxiliary power for the fan could be hooked up.

### Men with Open Lights Ignite Gas in Shaft Abandoned and About to Be Reopened

An explosion of a pocket of gas at the base of a 200-ft. shaft at the Marcoll mine of the Maher Collieries Co., near Clarington, Monroe County, Ohio, Aug. 2, was responsible for the fatal burning of two men and for the serious burning of others of a party of six men who descended the shaft which was being reopened. The shaft was sunk two years ago and had never been used. At the bottom, entries had been driven about 30 ft. in two opposing directions. The shaft had been allowed to fill with water awaiting the time when the mine would be completed and the hoist installed. There is not as yet any connection between the main shaft and the mine. Mining has been conducted in the property, but up to the present coal has been hoisted through the air shaft except that taken from the 60 ft. of entry just mentioned.

Recently the company decided to install a hoist in the main shaft. On the day of the explosion, Thursday, Aug. 2, the water had been lowered to within 2 ft. of the bottom, and the pumps were still working, endeavoring to lower the water still further. Men had gone down the shaft frequently but had detected no gas. Even as recently as 12 o'clock noon on Thursday three men had been inspecting the pumps at the bottom of the shaft. They carried open-flame lamps and stayed down a half hour or so without any mishap.

At 1:30 p.m. a party of six descended the shaft steps. In the group were William Maher, general manager of the mine; James F. McCurdy, a salesman for the Gee Electric Co., of Wheeling, W. Va., both of whom are now dead; Daniel Maher, a brother of the manager and in charge of the Rosemary mine nearby and L. F. Read, engineer for Allen & Garcia Co., of Chicago, Ill., both of whom are seriously burned but will recover, Harry W. Gee and David H. Parker, both of Wheeling.

Before the unfortunate six started down the stairs, William Maher borrowed two carbide lamps at the surface, and Read carried his own, making three open-flame lamps in the party. It is probable that William Maher was first to arrive at the bottom with McCurdy and Read close behind. They no sooner had reached the bottom than the gas ignited and sent a burst of flame up the shaft which mounted 10 or 15 ft. into the air

above it. The men on the surface gathered round the opening and were rejoiced to see five of the six men make their way alone and unaided up the stairs to the top. Will Maher and Read appeared first and were led down the short stairs from the top of the shaft collar to the ground. The others came up later, but Parker failed to make his appearance. Miners rushed down the stairs and found him lying at the bottom. They got several lungfuls of carbon monoxide helping him out. Though unconscious he needed little aid to bring him round. A doctor from Clarington and a trained nurse reached the mine soon after and treated the burned men before they started to Wheeling by train from Woodlands, a station across the Ohio River from the mine. At first it was hoped that all would recover.

An engineer who was at the mine two days after the accident said that in his opinion the explosion was a deplorably unfortunate occurrence with no blame to be attached to anyone. He said: "It is easy now to say that the shaft should have been ventilated and safety lamps used but who would ever have perceived that necessity before the explosion happened."

### Bulletin Board with News Photographs, Personal Message and Welfare Cartoons

WITH increased interest in safety, the bulletin board has become an important factor in most mines. Some have wished that, besides carrying the safety message, it might have a story of a somewhat different character that, being changed with frequency, would draw the men to a more frequent perusal of its contents. To this end the Elliott Service Co., 244 West 49th Street, New York, has introduced an industrial service which includes the placing of a three-section glass-enclosed green-enameled steel-framed bulletin board at the mines, displaying 14x17-in. news photographs which are changed every day. These news photographs occupy the central panel of the bulletin board



and on the left side is placed an inspirational paragraph on safety, health, education and like subjects delivered by a man of national fame and made personal by the use of his photograph. On the right are placed several safety bulletins and also perhaps some objects of local interest in connection with safety. Here may be displayed a piece of a shirt or overalls that have been torn off by some machine, carelessly left unguarded, or goggles which have served to protect the eyes of a workman from a flying piece of steel.

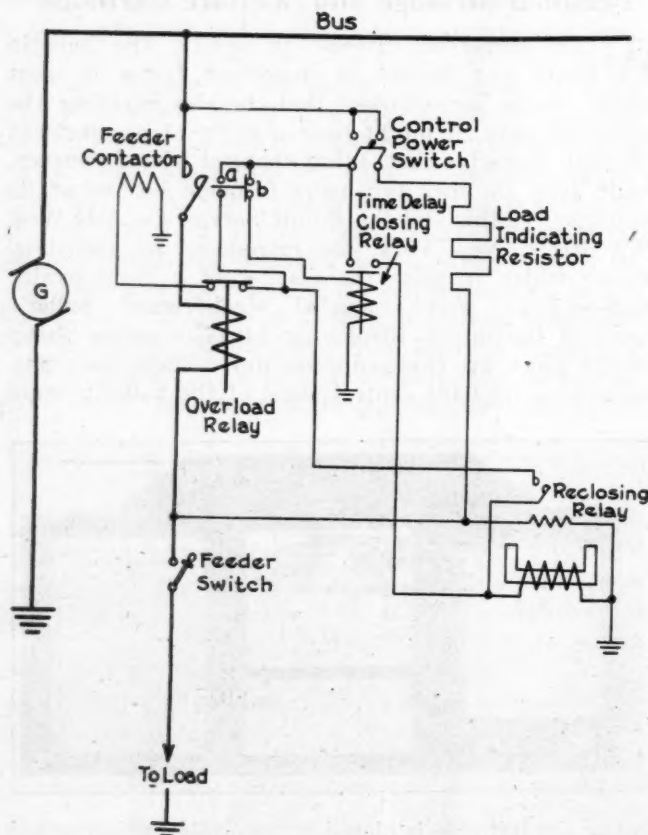
This service also provides a printed sheet "Introducing Jim Kelly." That worthy gives utterance to a number of wholesome and plain truths in a pleasant and inspiring manner. The board measures 32x64 in.

## New Equipment

### D.-C. Automatic Reclosing Equipment

**A**UTOMATIC reclosing equipments have recently come into use in mine installations for use on circuits supplying power to hoists, cutting and drilling machines, mine trolley systems, etc., in industrial plants, and on street railways. The reclosing feature insures continuity of power at the load under normal conditions and at the same time is a reliable protection to the main-line apparatus in case of a disturbance on the feeder. The automatic character of the reclosing apparatus eliminates delays that might arise from the necessity of reconnecting the load manually.

An automatic reclosing equipment of such a character for use on direct-current circuits of 300 and 600 volts was recently developed by the General Electric Co. Its function is to protect apparatus in case of short-circuits or heavy overloads occurring on the feeders, while in-



**AUTOMATIC RECLOSING BREAKER EQUIPMENT**

Continuity of service has become an important factor in coal mining. This breaker restores service to a line immediately the line is cleared of the cause of the interruption. Furthermore, no attempt is made to reclose when a high load remains on the line; this prevents serious peak loads being thrown on the machine at closing.

During continuity of service when the trouble is only temporary. It is designed for use on circuits employing stub-end feed, a combination of stub-end and multiple feed, or in combination with a sectionalizing switch, or sectionalized feeder.

The operation on stub-end feed, where there is only one source of power to the load, is typical, and its description will serve to give an idea of how the appara-

tus functions. The devices that go to make up the equipment are a shunt contactor, an instantaneous overload relay, a reclosing relay, a control power switch and a load-indicating resistor. These devices are connected in accordance with the wiring diagram.

The sequence of the operation of the equipment in case of short-circuit or heavy overloads on the feeder is as follows: The overload relay opens its contacts, de-energizing the coil of the contactor, which opens, disconnecting the load from the source instantaneously. When the contactor opens it closes auxiliary switch (b) which energizes the coil of the time-delay circuit closing relay, which starts to close. The time delay is inserted at this point in the sequence of operation in order to allow conditions on the feeder to become stable. The closing of this relay completes the circuit through the lower coil of the reclosing relay.

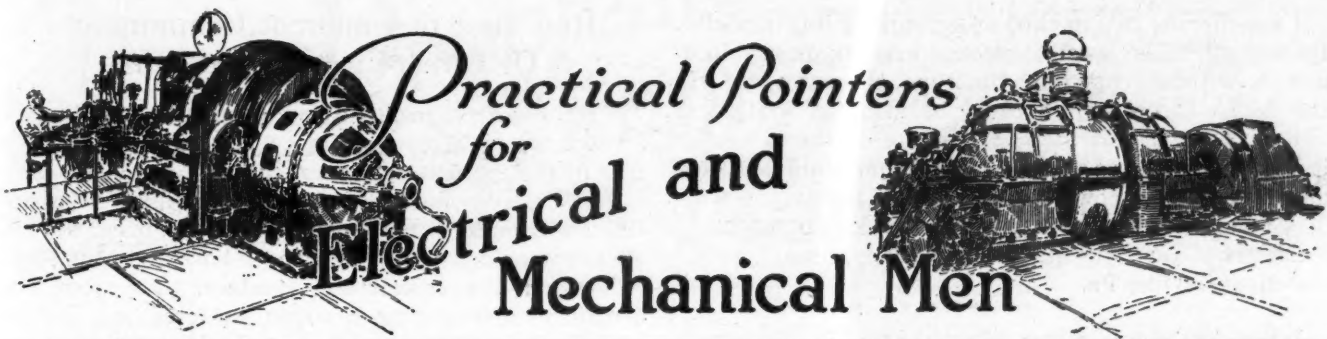
The reclosing relay has two coils, and to operate must have both of them energized. Its operation somewhat resembles that of a voltmeter, the lower coil being analogous to the permanent magnet of the meter, and the upper furnishing excitation to the movable element on which the contacts are mounted. The relay contacts will close only when the drop in voltage across the load, with which the upper coil is in parallel, becomes enough to cause that coil to excite the movable element sufficiently to close them. When the load resistance is zero, as in case of a short-circuit, there is no voltage across the upper coil, but when the load resistance is infinity, or open-circuit conditions exist, there is practically full voltage across the upper coil, because its resistance is so much greater than that of the load-indicating resistor. Therefore it is possible to obtain an intermediate point, and calibrate the reclosing relay so that with a definite value of resistance in the load-indicating resistor the equipment will not close on a load in excess of a predetermined value.

As long as the trouble on the feeder continues the reclosing relay will remain open, even after the time-delay relay has closed, because the voltage across the load is not enough to close the contacts. As soon as the trouble has cleared and the load resistance has passed the predetermined point, the relay will close, energizing the coil of the feeder contactor, which closes, causing the closing of the auxiliary switch (a), which seals it in. The closing of the contactor reconnects the load and de-energizes the time delay relay, which opens its contacts.

The equipment for circuits having a combination of stub-end multiple feed makes use of a contact-making voltmeter to indicate when the potential difference between the feeder and the source has fallen to a safe reclosing value. When the voltage has so fallen, the feeder contactor recloses in the same sequence as in the former case. A relay connected in parallel with the contact-making voltmeter determines whether the equipment is to operate on multiple or stub-end feed.

**EXCELSIOR—BALES OF IT**—is now being used by anthracite shippers to make tight the bottoms of coal cars, particularly for the shipment of fine sizes. It is readily stuffed into cracks and holes and makes a better filling than hay, straw, stones, old iron or planks. It has the further advantage that if it becomes mixed with the coal when unloaded no damage is done to conveying machinery or stokers. It can be had at a little over 1c. per pound. Some companies are reported to be using it by the carload.





### Electric Braking on Mine Locomotives

I WAS greatly interested in the article entitled "Theory and Operation of Electric Braking" which appeared in the July 5th issue of *Coal Age*, and am therefore prompted to use your columns to give some interesting experiences along this line which I had some few years ago.

Believing in the possibilities of electric braking for mine locomotives, I made some experiments on a Goodman 4-ton locomotive which was driven by a single motor. I took the locomotive to the top of a grade, hooked down the trolley pole, grounded the trolley cable to the frame of the locomotive, reversed the controller and released the brake. I was greatly pleased with the manner in which I could control the speed of the locomotive while going down the grade. By operating the controller handle the braking effect could be varied over a wide range. Later I tried out the scheme with a loaded trip and had the same results.

When it came to trying out this idea with a locomotive with two motors the results were different. The two motors or generators, as they should properly be called under these conditions, would not build up together, in parallel. The first generator to "pick up" would force a current through the other dynamo and tend to drive it as a motor in a direction opposite to that which the locomotive would be moving at the time; the result was a very quick dead stop. To overcome this difficulty I arranged a connection in the controller as shown in Fig. 1 which in effect established an equalizer connection between the two dynamos while operating as generators in parallel. This arrangement seems to have no particular objectionable features and is quite simple and shown in Fig. 2. With this connection, when the fields are in parallel, no matter which armature would start generating first, both fields would become excited and the same amount of current would flow through each field, thus both generators would build up and generate a current which would flow through the external circuit, through the resistance and controller where it could easily be varied.

With the courtesy of our general superintendent I was permitted to give this scheme a thorough tryout. At our No. 4 mine there is an outside haulage or tramway a mile and a quarter long between the mine and the tippie which has an even heavy grade. It is the usual custom of haulage to have brakes set on most of the loaded mine cars when dropping the trip down this grade and to use the hand brake on the locomotive or power from the trolley line when necessary to control the speed. A 10-ton locomotive ordinarily will not control more than twelve loaded cars on this grade with the locomotive hand brake alone and no brakes set on the cars. I equipped a Westinghouse Type 58, 10-ton

locomotive with a heavy single-pole double throw switch on the trolley cable with the one position grounding the cable to the frame and used the equalizer connection. It was a very simple matter to handle a trip of fifteen loaded cars without the use of any mechanical braking, being able to check from maximum ordinary speed to a dead stop in a length of fifty feet, of course using the hand brake after the final stage of the electric braking was reached. I feel positive that a trip of twenty-five cars could easily be handled in this same manner, although we have never tried so many without some of the car brakes set.

The controller was the ordinary series and parallel type. The equalizer connection was permanently established by brazing a copper jumper between two segments of the reverse cylinder on the parallel position. The series position can also be used independently. This jumper on the parallel position does not interfere with the hauling in the opposite direction (up grade) in fact, this equalizer seems to be a great aid in hauling in parallel, as explained below.

Ordinarily it happens that, during a heavy haul when sand is used on the rails one truck will start spinning, which requires shutting off the controller and starting up again. It is easily understood why a series wound motor will race when it loses its load and, when the wheels start spinning the friction decreases and the speed increases, due to the weakened field under a lighter load. But, with the use of the equalizer, both fields are always excited the same amount and the tendency for one truck to race when the other is down to a heavy haul is greatly lessened. This, of course, prevents a considerable amount of the lost friction and increases traction. So, why not use the equalizer in hauling as well as in braking?

I can find only one disadvantage in having the equalizer connection permanently established. This is in case of damage or injury to either an armature or field of either motor. Ordinarily, when one motor fails, it can be cut out of the circuit easily and the locomotive can then "limp" in for repair on the other motor. But, with a permanent equalizer either the armature or the field or both on the damaged motor must be disconnected before the locomotive can be moved on its own power to the repair shop or motor pit.

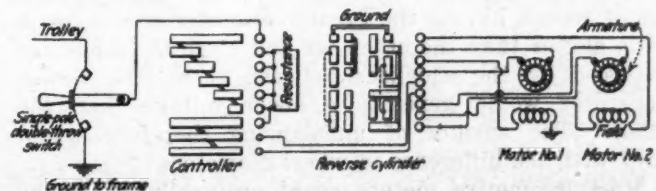


FIG. 1—CONTROLLER WITH EQUALIZER-CONNECTION  
The dotted lines show where the equalizer was tapped in. Note that it is necessary to put an equalizer on the forward and reverse parallel positions.

I am offering this method on account of its simplicity. Its use will make possible electric braking on any locomotive without changing the type of controller. If the double-throw switch could be mounted so that it could not be thrown without shutting off the controller it should be done, as throwing the switch while the locomotive is using power will cause a heavy arc with disastrous results.

E. L. HOLSOPPLE.

Electrical Department, Knickerbocker Mines,  
Hooversville, Pa.

Where the single motor drive is used, Mr. Holsopple has met all the requirements for electric braking by simply grounding the trolley cable and reversing the controller so that it is operated the same way as it would be if climbing a grade with the assistance of the power system in that direction instead of descending a grade. That is, the direction of rotation is the same as motoring down grade but the field has been reversed thus making the motors function as generators.

In the case of two motors acting as generators in parallel and with an equalizer circuit between them, there are some disadvantages which must be considered. With any two motors there is a variation in the magnetic circuit and in the resistance of the windings due to manufacturing limitations. With the equalizer connection the current will divide between the fields in proportion to the resistances of the field windings.

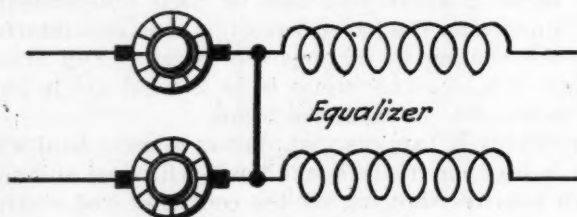


FIG. 2—SIMPLIFIED EQUALIZER DIAGRAM

This sketch shows how the current generated in either armature may divide and excite both fields.

Even when these resistances are approximately equal the ampere-turns for setting up the magnetic flux of the poles will be approximately equal only when the turns of wire in the field coils are equal. Furthermore the flux set up by equal ampere-turns is a function of the magnetic circuit which is variable in all motors. Therefore unless the flux is exactly equal there will be a circulating current between the armatures through the equalizer which will tend to overload one of the motors. This condition exists both when motoring or generating. Care should therefore be taken whenever an equalizer circuit is used instead of transposing the fields, as the overloading of one of the motors may become serious.

Other causes for unbalancing may occur. One such cause may be the difference in diameters of the driving wheels connected to each motor. When the motors are operating as generators, the generator connected to the set of wheels having the greater diameter would run a little slower than the other set and since the fields are balanced by the equalizer between them, the slower generator would generate a lower voltage than the other. The amount of unbalancing therefore would vary with the difference in wheel diameters.

Most locomotive motors could ordinarily stand the slight unbalancing which might occur under general conditions. However these are factors which must be considered so as to be on the safe side.

## How Best to Undercut Commutators Of Direct-Current Armatures

THE object of undercutting commutators is to clean out the mica between the copper segments from the face of the commutator to a depth of  $\frac{1}{8}$  in. This gives a smooth, even surface, which is not always possible when the mica is not undercut. Hard mica will not always wear down with the copper bars and thus leaves ridges on the commutator surface. The completed armature, after being rewound, soldered and banded, has the commutator trued up and all excess solder removed from the neck and face, and is then turned over to the undercutter. If undercutting were done before soldering, the excess solder might fill up the grooves and short-circuit the commutator bars.

The most efficient machines for doing this work are special lathes with either motor-driven or belt-driven circular saws clamped on an arbor which is mounted on a head that moves on slide rails. By means of a hand-operated lever or a foot pedal controlled by the operator the revolving saw is carried over the face of the commutator. The head carrying the arbor is fitted with an adjusting screw to adapt the height of the saw to commutators of different diameter. An air hose and hood sometimes are provided to carry off the mica dust. A less expensive equipment to do this work consists of an air- or power-driven (through a flexible shaft) circular saw, which is guided over the commutator face by hand. A handsaw consisting of a piece of hacksaw blade mounted in a holder for doing this work, also a small cutter to clean the slots of small particles of mica left by the circular saws often are used.

The armature is mounted between the centers of the special lathe, or on two horses if the hand-guided saws are used, so that it can be rotated readily. The small circular saws are revolved at approximately 2,000 r.p.m. and are drawn toward the operator, so that he can guide the cut. The cutting edge of the saw should revolve in a direction toward the operator while it is cutting the mica.

After slotting is completed, the face of the commutator should be thoroughly polished and cleaned of all particles of copper by means of emery cloth. The special lathe can be so equipped that this polishing is done without removing the armature from the lathe centers.

It is essential that all particles of mica be removed from between segments by this operation; thus it is advisable to use a saw about 0.005 in. larger than the thickness of the mica to be undercut. A small diameter saw must be used in order to cut the slot to the proper depth and at the same time not cut into the neck of the commutator. After the slots are sawed it sometimes is necessary to go over them with a small hand cutter, to remove all remaining particles of mica.

A clean undercut commutator prevents high mica, which reduces the burning of the commutator bars, increases the life of the carbon, and practically eliminates flashing. This results in greatly reduced maintenance cost.

An undercut commutator should operate from one heavy inspection period to another. If an armature is removed from the motor frame for any other repairs, however, the commutator should be carefully inspected, and if the mica is getting flush with the copper the commutator should be carefully trued up and then undercut and smoothed.





# Problems of Operating Men

Edited by  
James T. Beard



## Facts Throwing New Light on the Wakesiah Explosion

**Pumpman Killed by Coal Blown from Cars on Main Slope—Jack Hammer Drills Made Much Fine Dust—Air Laden with Gas and Dust Ignited on Lamp**

I HAVE read with interest the letter of "Mining Engineer, No. 2," *Coal Age*, June 7, p. 940, relating to the Wakesiah mine explosion of Nov. 24, 1922, and asking for more detailed information in regard to the exact position of the pumpman who was killed by the blast, and the location of the motor driving the pump.

In answer to the first question, kindly permit me to say that the pumpman was found, after the explosion, lying on the main slope directly opposite and about eight feet from the pump. The pump was driven by compressed air. There was no electric motor, as the second question would seem to imply.

### COAL BLOWN FROM CARS KILLS PUMPMAN

Standing on the main slope, about fifty feet below the pump where the pumpman was picked up, there was a trip of six loaded cars. Such was the force of the explosion that this was moved up the slope twenty feet, as shown by the amount of slack rope.

The pumpman was killed instantly by the flying coal that was blown from the top of the cars and scattered a long distance up the slope. My duties following the disaster were such as to enable me to see the actual conditions that existed in the mine and I am therefore speaking from personal knowledge and observation.

First, in respect to the lamps, as has already been stated by other writers, the men were all equipped with electric cap lamps, except the fireboss who carried the only flame safety lamp used in the mine.

### TESTS SHOW LAMP WAS IN GOOD CONDITION

From my own knowledge, I can say that the lamp had been subjected to test in a highly explosive mixture and found to be in good shape after the accident, although the gauze showed signs of intense heat.

It is my firm belief that the point of ignition of the gas was at the place where the fireboss' lamp was found. Careful study of the situation and observation of the facts leaves no doubt whatever in my mind but that the gas ignited on this lamp. Whether or not the lamp was properly handled is another question and one that I will not assume to discuss further than to say a safety lamp ceases to be safe when improperly used.

The evidence obtainable on the fateful morning of the explosion, in respect to the point of ignition was very marked. There were the burnt cap and the blistered bag of the fireboss, showing plainly the immediate presence of flame. There were, besides, numerous signs of force emanating from that vicinity.

It is true the fireboss was not killed by the blast, but was overcome by the afterdamp when he had fled 100 ft. from where he dropped his lamp. It must be remembered that his position in the *cul de sac* protected him from the full force of the blast, which gained strength as it swept up the slope 250 ft. to where it felled the unfortunate pumpman.

### JACK HAMMER DRILLS MAKE MUCH FINE DUST

One factor that I believe has not been mentioned in connection with this disaster is the presence on the walls, floor and timbers of much finely powdered coal dust. In this section the miners largely drilled their holes with a jack hammer drilling machine. Anyone familiar with this tool knows the quantity and extreme fineness of the dust produced.

Consider then what would be the result of starting to blow out from its lodgment a body of gas by the use of a blast of air under a pressure of 90 lb. per sq.in. When the fireboss turned on the air undoubtedly this fine dust was thrown into suspension in the air and formed a most dangerous atmosphere with the gas dislodged from the roof. It is pleasing to know that the Coal Mines Regulation Act has now been amended and forbids the use of these machines without some means being employed to prevent the suspension of the fine dust in the mine air. The act also forbids the use of compressed air for blowing out gas from where it is lodged in a mine.

### PROBABLE MOVEMENTS OF THE FIREBOSS

Observing the position of the nozzle of the air hose, I noticed it was directed upward in a slanting direction in a manner that would force the gas down on the lamp, which was 21 ft. away from the nozzle. The nozzle I would say was about 4 ft. inside of the gas, leaving only 17 ft. from the gas to the lamp.

Presumably, after adjusting the position of the nozzle, the fireboss had gone down and turned on the air at the valve, 30 ft. below, and then walked back up the road to wait till the place was clear, so that he could so report, this being the last place on his round and the time being about up for making his examination of the mine.

Considering the velocity of the blast from the air hose and the fact that the fireboss was advancing up the slant against the air highly charged with gas and fine dust, one has no difficulty to imagine what happened.

In conclusion, allow me to remark that it behooves every man when using a safety lamp, for any purpose in a mine, to handle the lamp with the utmost of care and not to violate the principles on which it was designed. We are all of us too prone to omit many precautions that make the use of the lamp safe. The price of safety is eternal vigilance.

Nanaimo, B. C.

S. K. MOTTISHAW.

## Moving a Body of Gas Dangerous Work

*Use of compressed air in moving gas a dangerous practice that should be stopped—Move a large body of gas a little at a time—Give air current time to dilute gas—Watch lamps closely.*

HAVING moved much gas in mines, I have been deeply interested in what has been written regarding the fatal Wakesiah explosion caused by a fireboss' attempt to blow out an accumulated body of gas with compressed air.

The letter of Glen Calder, which appeared in *Coal Age*, April 5, p. 568, particularly impressed me and I quite agree with him that the practice of removing gas, from a place where it has lodged in a mine, by the use of compressed air is extremely hazardous and should be stopped.

Anyone who undertakes to move a body of gas should remember that he is about to deal with a dangerous proposition. He should exercise every precaution, run no chances and take nothing for granted. First, study the situation carefully before taking any steps to disturb the gas.

### SAFEST PLAN IN MOVING LARGE BODY OF GAS

When moving gas the safest plan is to first withdraw all men from the mine, unless one can feel that there is absolutely no danger to those remaining at work. The fireboss or man in charge should always take with him an experienced helper.

He should test carefully and know, as nearly as possible, about the volume of gas he must handle. This will make it possible for him to gage properly his air current, which must be strong enough to act efficiently on the body of gas and effect its removal.

It is of most importance to move a large body of gas a little at a time, which will give the air current time to dilute the gas and render it harmless as it passes out of the mine. In this manner there is no danger to be feared from the return current becoming highly explosive.

It is my experience that a person cannot be too careful in the handling of gas. A very slight mistake may mean the loss of one or more lives. Far better is it to lay the mine idle than to take any chance of accident that may prove fatal or destroy valuable property.

By directing a large air current against a considerable body of gas, it may be caused to descend onto the lamps, which must be closely watched and removed from the place on the first appearance of danger.

Loogootee, Ind.

JACOB RILEY.

## Bituminous Mine Law (Pa.) on Ventilation

*Insufficient ventilation of mine chief cause of explosions—Bituminous law not lacking in this respect—Strict compliance with what the law requires needed to avert disaster.*

SINCE reading the good letter of C. W. Atkins, *Coal Age*, March 1, p. 378, naming different conditions in mines that invite explosions, it has been on my mind to offer a few comments bearing on the requirements of the mine law with respect to ventilation.

While I heartily agree with Mr. Atkins that an "insufficiency of ventilation" is a chief cause of many mine explosions, I fear he has overlooked certain references in the law when he says, "The volume of air in

circulation may be sufficient to comply with the requirements of the mining law and yet not enough to dilute and sweep away the gases generated in the workings of a mine."

As I understand the Bituminous Mine Law of our state it requires the ventilating current in a mine to be sufficient to "dilute, carry off and render harmless the smoke and the noxious and dangerous gases generated therein." If this is not done the circulation has not complied with the law's requirements.

### LAW PROVIDES FOR EVERY POSSIBLE CONDITION

Perhaps, the statement first quoted above has reference to the specific requirement (Art. 9, Sec. 1) of "not less than 200 cu.ft. per min." for mines generating gas. But the law adds "and as much more . . . as one or more of the inspectors may deem requisite." This clause should certainly be broad enough to fully meet any and every condition that can reasonably be expected to arise in a mine.

What could be more full and explicit in respect to the ventilation of mine workings than the following paragraph of the same section of the law:

The ventilation shall be conducted through the main entries, cross entries and to the working faces of all working places in the mine in sufficient quantities to dilute, carry off, and render harmless the smoke and the noxious and dangerous gases generated therein, to such an extent that all working places and traveling roads shall be in a safe and healthy condition for the persons working and traveling therein.

The number of explosions that have occurred recently should incite every miner to use his utmost efforts to prevent their recurrence. We are led to wonder if the next disaster will come closer home. Are we, one and all, doing what lies in our power to avert these terrible calamities and make them history of the past?

It is my belief that if every official of a gaseous mine would insist on a strict compliance with every requirement of our state laws and take no chances there would be a large reduction in mine fatalities. This discussion in *Coal Age* should nerve every man to action.

JAMES THOMPSON.

Mayport, Pa.

## Permissible Explosives vs. Black Powder

*More enlightenment needed regarding use of permissible powders—Use of black powder not justifiable—Why permissibles often fail—Firing by electricity safest and most efficient method.*

FOR some time past I have been watching and waiting for the question of the use of permissible explosives to be brought to the attention of *Coal Age* readers. It would seem that greater efforts should be made to enlighten mining men, both operators and miners on this important subject.

If this was done more persistently and systematically there is no doubt in my mind but that this class of explosives would come into more extensive use in coal mines than is true today.

### CONTINUED USE OF BLACK POWDER UNREASONABLE

In the larger development of mines and the rapidly increasing production of coal, it is evident that the continued use of black powder for blasting down the coal is going to be a chief factor in maintaining a high accident rate in this country.

From the standpoint of safety and efficiency in mining, the use of black blasting powder in coal mining



cannot be justified. Arguments in its favor, however plausible, are without the sphere of reason. It is true that, owing to its slower action, larger coal is produced and a less proportion of fines and dust are the result.

On the other hand, the larger amount of flame projected into the mine air when a shot is fired must always be a menace to life and property, which no responsible operator or miner can ignore. This fact alone is enough to debar absolutely the use of black powder in any coal mine.

#### OPPOSITION TO USE OF PERMISSIBLE POWDER

It has always seemed strange to me that there should be so much of opposition manifested, on the part of many operators and miners, when an attempt is made to introduce permissible powder into a district or even a single mine. The danger in the use of black powder is well known and yet many prefer to take the chance because of the promise of producing larger coal.

It has been my lot to have worked, at different times, in mines where either of these explosives have been in use. I could not fail to observe what varying results were obtained, because of lack of care and judgment in choice of suitable grade of powder or proper weight of charge in shooting different coals.

When making my daily examination, in a mine using permissible powder, I would often notice what little work the powder had accomplished, in respect to the extent of face blasted in those places. The coal would generally be seriously pulverized and much dust produced, making the mine dangerous.

In other places, where the explosive was better suited to the coal in question, a good grade of marketable coal was invariably produced and there was not the same difficulty experienced in squaring up the face, which requires much extra labor on the part of the miner when this has to be done because the coal does not shoot right.

#### WHY PERMISSIBLES GAVE POOR RESULTS

My observations led me to conclude that, in most instances, the pulverizing of the coal and the need of extra work to square up the face was owing to excessive charges of powder or poor judgment of the miner in placing his shots. These results, however, whatever their cause and whatever the conditions of their occurrence, have naturally made working men regard permissibles with disfavor.

My opinion is that electric firing is not only far safer practice but is a more efficient method and gives better results in the use of permissible powders. The simultaneous firing of a number of shots in a place eliminates the danger of a miner returning too quickly to the face, which is often the case in firing single shots. There is also a saving in explosive for the same work performed.

Finally, permissible explosives are made up in cartridges of less diameter, requiring smaller holes and a lesser number of them for the same tonnage of coal mined. It is also easier to tamp a small hole than a large one. The drills are lighter, more easily handled and cost less than the drills used previously. In fact, a miner will often find that a common breast auger is all that is needed when using permissible powder in blasting his coal. The size of the hole is the important factor. Labor should appreciate the fact that it is far easier to drill a 1½-in. hole than a hole 3 in. in diameter.

Linton, Ind.

W. H. LUXTON.

## Inquiries Of General Interest

### Flooding Prevents Operation of Slope Mine

Mine Underlies Creek Bottom—Water Drowns Out Workings During Rainy Season—Lining Slope with Concrete Fails to Keep Water Out—Steel Door Proposed

WE ARE having much trouble of a very serious nature in endeavoring to keep water from drowning out the workings in our mine. The water comes from the surface drainage and at times of the heavy spring rains the inflow is so great as to threaten the life of the mine.

Our mine is opened by a slope that was started in a bed of quicksand 30 ft. deep and driven on an inclination or dip of 11½ deg. After being drowned out at two different times in a single year, I decided to concrete the mouth of the slope, starting from the entrance and continuing for a distance of 300 ft. to where the slope reached the coal.

This plan seemed to me full of promise of making the mine comparatively dry. The work was well done, the top and both ribs of the slope being covered with a layer of concrete 18 in. in thickness, at a cost of \$9,000 when the work was completed. Much to our disappointment and discomfiture, the result was a failure as the concrete lining did not prevent the water from finding its way into the mine and the next heavy rain again filled the mine and we were obliged to cease work. The water appeared to seep down behind the concrete ribs and come up through the floor of the slope. I should have stated that this mine underlies a creek bottom.

I propose now to build a steel door at the end of the concrete lining, at the foot of the slope. The coal here is five feet in thickness. The door is to be made water-tight and I want to ask the opinions of *Coal Age* and its practical readers if they think this door will keep the water from flooding the mine in time of freshet.

Hartshorn, Okla.

JOSEPH MAGDALENA.

Here is a proposition that should call forth many practical and helpful suggestions. The seasonal flooding of such mines is not uncommon in the practice of coal mining and the experiences of others in like situations will be of untold interest.

There is little doubt but that a heavy steel door could be built at the foot of the slope capable of sustaining the pressure that would be thrown on it in the event of the slope filling with water during a wet season. The question is, however, Could the structure be made water-tight and the water kept out of the mine, which is the object sought, till the danger is past and the water can be pumped or bailed from the slope by water cars.

Assuming an opening 6x10 ft. in section the total maximum pressure at the foot of the slope would be,  $62.5 (6 \times 10 \times 300 \times 0.19937) \div 2,000 = 112\frac{1}{2}$  tons which is not excessive. The problem then would be to make the floor and surrounding strata impervious to water. Let us hear from our practical readers.

## Examination Questions Answered

### Penna. Bituminous Examinations, Foremen and Firebosses

(Selected Questions)

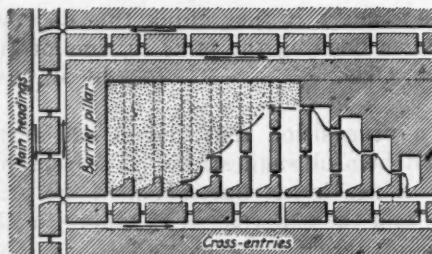
**QUESTION**—(a) What are the principal causes of accidents in coal mines? (b) What precautions would you take to reduce such accidents to a minimum?

**ANSWER**—(a) In the order named the most frequent causes of accidents in the mining of coal are the following: Falls of roof and coal; movement of cars and locomotives; gas and dust; electrical equipment of all kinds; use of explosives; shafts and steep slopes.

(b) Supervise carefully and closely all work at the face; enforce strictly all rules and regulations regarding timbering, blasting and haulage; instruct workmen in safe practices; install and maintain needed safety appliances; attend carefully to the efficient ventilation of all working places, roads and travelingways; and finally operate the mine in full compliance with law.

**QUESTION**—Describe in detail how room pillars should be drawn with mining machines, to secure the greatest recovery of coal, with the highest degree of safety to the workmen and the greatest economy in the use of posts and other material.

**ANSWER**—In drawing room pillars with machines, the main point is to develop the mine with the room pillars of such size that they will suffer no crushing effect in the first working. In machine work where roof conditions will permit, advantage is gained by driving double rooms with a 50- or 60-ft. breast for working the machine. In any case, however, when drawing the pillars the cut must be started on the side of the pillar farthest from the gob, in order to afford better protection for the men and the machine. In driving single rooms with track laid along the straight rib, this will



necessitate widening the rooms in the direction the work is advancing, in order to facilitate loading the coal on the track and keeping the machine on the side of the pillar away from the gob. The accompanying figure shows advancing room-and-pillar work where the rooms are widened inby and the track is then laid on the inby side of the straight rib.

**QUESTION**—Assuming that you were in charge of a non-gaseous mine worked with open lights and explosive gas is discovered on certain pillar falls, what precautions would you take to safeguard the workmen; (a) before removing the gas; (b) while removing the gas; (c) after the gas has been removed?

**ANSWER**—(a) Send reliable men to notify all workers in that district or section to extinguish their lights and conduct them by the safest route to the shaft or slope bottom or mine entrance. Also, station reliable men to guard all approaches to the affected district and the return air-course.

(b) Select competent helpers and equip them with good safety lamps. As far as practicable, increase the circulation of air in the district if that is needful. Approach the gas on the intake side, keeping a close watch of the lamps as you proceed. Erect what brattice or canvas may be needed to direct the air onto the gas. Proceed slowly, giving time for the air to dilute and move the gas. Make frequent tests with a lamp to observe progress of the work. This answer assumes holders of first-grade mine foremen's or fireboss' certificates. (c) When the gas has been removed, begin at the intake end of the district and examine each working place and all idle or abandoned places, roads and travelingways for gas and other dangers and enter a report of the examination in the report book. This must be done before permitting any men to return to work.

**QUESTION**—(a) What are the general causes of mine fires in non-gaseous mines? (b) What precautions should be taken to prevent them?

**ANSWER**—(a) Careless use of open lights in proximity to combustible material; use of flame torches in stables, pump and tool shanties, or in handling cars of hay and powder on the shaft bottom or haulways; spontaneous combustion of oily waste; ignition of dust or timber from short-circuited wires not properly installed; and failure to keep fine coal and dust from the waste in mines.

(b) Care in use of open lights; rigid enforcement of strict rules and regulations regarding the handling of combustible material, explosives, oily waste and other supplies; and regular close inspection of all waste and void places in the mine.

**QUESTION**—What equipment should be installed with electrically driven pumps and what provision should be made to insure safety, the installation being of a permanent nature?

**ANSWER**—The Bituminous Mine Law (Art. 11, Sec. 5) requires every stationary motor underground and its starting resistance to be protected by a fuse on each pole, or circuit-breaking device on at least one pole for d.c. and two poles for a.c. motors, and by switches to cut off the power; such devices to be in a convenient position near the motor. A motor of 100 b.h.p. must be further equipped with a meter to indicate the load on the machine. Motors exposed to gas-charged air must have all live parts, starters, terminals and connections enclosed in an explosion-proof casing of incombustible material, which cannot be opened by any unauthorized person.

**QUESTION**—What is the capacity of a double-acting pump 12 in. in diameter, running at a piston speed of 120 ft. per min., the efficiency of the pump being 85 per cent?

**ANSWER**—The sectional area of the pump cylinder in this case is  $0.7854 \times 12^2 = 113.1$  sq.in. Running at a piston speed of 120 ft. per min., the piston displacement is  $120 (113.1 \div 144) = 94.25$  cu.ft. per min. Then, since 1 cu.ft. = 7.48 gal., and for a water-end efficiency of 85 per cent, the capacity of this pump is  $0.85 (94.25 \times 7.48) = 599.25$  gal. per min.



# Anthracite Miners and Operators Resume Wage Parley

Negotiations between the anthracite operators and miners were resumed at Atlantic City on Monday of this week, after more than three weeks' suspension. The U. S. Coal Commission is directly responsible for breaking the deadlock and bringing about the resumption of the conferences. It called the representatives of both sides to New York last week and, after reading notes from them for two days, wound up the proceedings by asking them to state in writing just why they could not get together to prevent a strike on Sept. 1.

The issue of the check-off—the refusal to grant it by the operators and the insistence of the miners that it must be granted before negotiations could proceed—was brushed aside by the miners when it came to the showdown before the Commission and the negotiations are resumed this week as if that issue had not for three weeks threatened to plunge the industry into a strike.

The most significant developments of the week were the operators' acceptance of the miners' offer to abandon the check-off for occupational and all other deductions from pay in exchange for the union dropping the check-off for union dues; the operators' offer to renew the present agreement until April 1, 1925, or to arbitrate wages as well as all other matters in dispute, pledging themselves in such an event not to ask for a reduction; the plain word from Washington that if the miners want to strike the country will have plenty of other fuel offered it, and the backdown of Lewis from his ultimatum of July 26 in the face of a promise by the Coal Commission to tell the country what's what if he wouldn't play ball.

## LEWIS MAKES THREE PROPOSITIONS TO COMMISSION

When the hard-coal miners and operators gathered at the Pennsylvania Hotel in New York on the morning of Wednesday, Aug. 15, they found that they had not been called together by the Coal Commission but instead were being asked to report separately on why they had not continued their negotiations at Atlantic City. The Commission had two meeting rooms, and in one they first sat with the representatives of the miners. John L. Lewis wasted no time but at once filed with Mr. Hammond a statement setting forth just what the miners wanted as a precedent to getting back together with the operators. Negotiations had been broken off at Atlantic City on July 27 and Mr. Lewis had issued his ultimatum that the check-off and other features of demand No. 1 must be granted before a contract could be negotiated. His propositions to the Commission were three, one that private detectives in the pay of the operators in the mining region must be withdrawn, the second that the miners would agree to withdraw their demand for the check-off if the operators would agree to cease checking off, that is making deductions for items owed the company. His third was that if the operators would agree that they would give the check-off and agree in principle to a wage increase, they would start negotiations at once and promise to keep at work after Sept. 1, making any settlement retroactive to that date. This was transmitted to the operators late in the afternoon. The second proposal was stated as follows:

"That the United Mine Workers abandon its demand for a provision in the next contract providing for participating in the check-off arrangement; that in consideration of such abandonment the anthracite operators agree to a provision in the next contract whereby they will abandon their age-old practice of checking off from their employees payment for the long list of items herein incorporated, and such others as may exist.

"Upon this proposition the United Mine Workers desire a categorical reply from the anthracite operators through the United States Coal Commission. If the anthracite operators agree with this suggestion it will remove any obstacle which may now exist in prevention of an immediate resumption of joint wage negotiations. If the anthracite operators refuse this suggestion then the American people will understand the true selfishness of their position and the United States Coal Commission will be able to report to the President of the United States and properly place the re-

sponsibility for any suspension of anthracite production." As an alternative it was offered by Mr. Lewis that the following should be accepted:

"The representatives of the United Mine Workers have full appreciation of the natural desire of the coal consuming public to avert a suspension of production after Sept. 1. The mine workers join in this desire, and in consideration of the emergency which exists in the premises propose the following arrangement, which will relieve public apprehension and be endorsed by every citizen:

"That the anthracite operators agree that all men now working nine hours or more shall be given an eight-hour day with commensurate compensation, effective as of Sept. 1; that the necessity of a wage increase be recognized; that the United Mine Workers be accorded the privilege and convenience of the check-off arrangement, effective the same date; that in consideration of such arrangement all other matters be immediately taken up in joint negotiations and the anthracite mines remain in operation pending such negotiations, with a proviso that agreement on all matters when reached shall be retroactive to Sept. 1, 1923.

"In making the foregoing constructive suggestion, the representatives of the United Mine Workers have in mind that the anthracite operators have announced that they agreed in principle with the demand of the mine workers that the eight-hour day apply to all classifications of labor. We also have in mind that in making the check-off arrangement effective Sept. 1, no cost is involved either to the anthracite operators or the consuming public."

Later the same day the anthracite operators gave out their acceptance of the proposal to abandon the checkoff of all items of debt incurred by their employees. Their letter addressed to the Coal Commission follows:

## OPERATORS AGREE TO DISCONTINUE DEDUCTIONS

"The Anthracite Operators are gratified to note the willingness of the miners' representative to abandon their Demand No. 1, calling for the 'check-off,' on condition that the operators discontinue the practice of deducting from the wages of employees certain specified items.

"The operators accept this proposition. They are prepared to agree in so far as the law of Pennsylvania will permit, to incorporate in the wage agreement a clause discontinuing the present practice, and placing the business upon a cash basis.

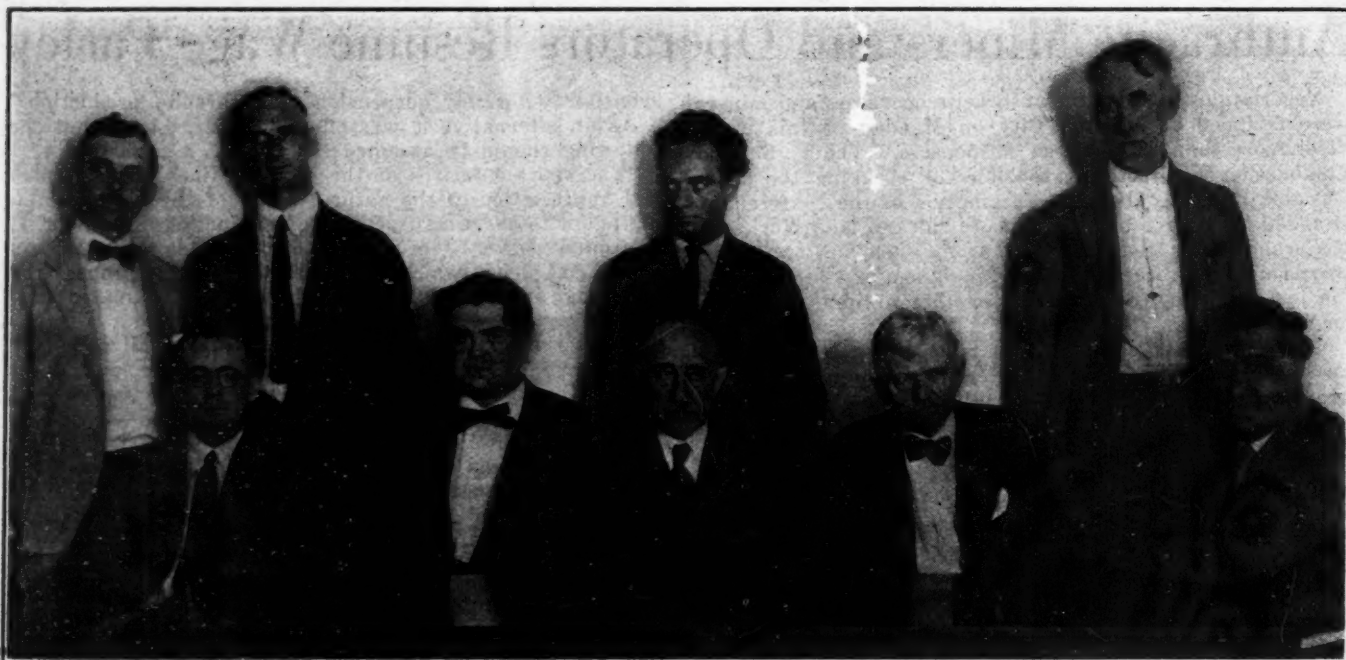
"Heretofore, the operators have extended credit to the men for the purposes named, charging the men's accounts currently and deducting the charges when wages were paid. The operators had assumed that this practice met with the approval of the employees since heretofore such practice has never been presented as a grievance. Neither did the eleven demands presented by the miners at Atlantic City embody any request to abandon this practice.

"If now the employees desire a discontinuance of the present practice, the operators are entirely agreeable. The existing practice having been put into effect for the convenience of the men, some inconvenience to them may result from its discontinuance. The operators, however, will be pleased to co-operate with their employees in working out methods which will reduce such inconvenience to a minimum.

"In agreeing to the foregoing, the operators assume that in accordance with the miners' proposition to your Commission, negotiations will be promptly resumed and that no suspension will take place September first, it being understood that the wage agreement, when consummated, will be retroactive to that date."

No statement was forthcoming from the union headquarters on Wednesday night after the operators filed their acceptance. Early Thursday morning Mr. Lewis talked to the newspaper men and indicated that the union men were not pleased with the form of Mr. Warriner's letter and that they would take exception to everything in it. Late that day they filed a reply, again to the Commission, stating that in their opinion the operators had not met their proposal. The letter follows, in full:

"The mine workers' representatives have given careful



#### ANTHRACITE CONFERENCE AT PENNSYLVANIA HOTEL, NEW YORK

Seated, left to right—Thomas Kennedy, president of District 7, United Mine Workers; John L. Lewis, International president, United Mine Workers; John Hays Hammond, chairman of the Federal Coal Commission; Thomas R. Marshall, member of the Commission, and George Otis Smith, another member.  
 Standing—E. E. Hunt, secretary of Commission; C. J. Golden, president District 9 United Mine Workers; Rinaldo Cappelleni, president District 1, United Mine Workers, and Dr. Charles P. Neill, Commissioner.

consideration to the letter filed with your Honorable Commission by Mr. Warriner. We do not believe that the communication constitutes a good faith acceptance of the proposal made by the mine workers yesterday for the abandonment of the present check-off system by the anthracite operators and the waiving of the check off demand by the United Mine Workers.

"The first paragraph of Mr. Warriner's letter expresses gratification that the mine workers have abandoned demand No. 1. The mine workers made no such offer, as their letter referred only to the check-off feature of demand No. 1. The operators' statement on this feature is therefore in error.

"The second paragraph of the operators' letter qualifies their acceptance by inferring that the laws of Pennsylvania will prohibit them discontinuing the practice. They have always heretofore insisted that the law prohibited them from instituting the practice. It is obvious and perfectly manifest to all that no written agreement could transcend the law of the Commonwealth or the Federal Government. The introduction of this qualification is therefore without warrant.

"The third paragraph of the operators' letter purposes to understand that the United Mine Workers desire that the anthracite operators desist from extending credit to their employees in commercial transactions. No such feature was incorporated in the mine workers' presentation, and neither do the mine workers propose to countenance such change. This matter is therefore extraneous and its introduction into a discussion of the check-off is not accepted by the mine workers' representatives.

"In the fourth paragraph of the operators' letter, Mr. Warriner proposes that the anthracite operators will deal with their employees individually in working out such matters. The miners in the anthracite region are members of the United Mine Workers and have given authority to certain officers of their organization to represent them upon all such matters. We therefore advise that the anthracite operators will not be able to deal with their employees upon an individual basis affecting this matter, and that the proposition in its entirety has nothing to do with the check-off proposal of the United Mine Workers.

"The closing paragraph of Mr. Warriner's letter states the operators' assumption that in agreeing to the abandonment of the operators' check-off system that no suspension will take place Sept. 1, in event a wage agreement is not

negotiated at that time. The anthracite operators are again strangely in error in this matter. Your Commission will recall that the representatives of the mine workers filed with your honorable body yesterday an alternative proposal calling for the operation of the anthracite mines after Sept. 1. This proposal has been ignored by the anthracite operators' representatives and we assume has been rejected by them. The matter of working after the first of September has no relation to the mine workers' proposal that the operators abandon their check-off system.

"The operators' letter is misleading and confusing in its every paragraph. The mine workers cannot accept it as an interpretation of their previous proposition. We made a fair proposal dealing exclusively with the check-off proposition and requested therein a categorical reply to the offer. Such reply has not been forthcoming. If a good faith assent is given to the mine workers' proposition, joint wage negotiations can be immediately reopened and there is no proper reason why an agreement cannot be negotiated prior to Sept. first and a suspension of anthracite production averted."

The operators promptly gave out a statement characterizing the miners refusal as an indication of their desire to avoid the issue. Mr. Warriner said that "The efforts of the operators to reach a peaceful adjustment by what they believe to be an acceptance of the miners' proposition of yesterday seem to have failed. The operators have earnestly sought to settle differences by peaceful negotiation or arbitration. They have offered and now offer either or both of these courses. The miners reject these peaceful courses and insist upon their demands under threat of a strike. They refuse arbitration and even insist upon the granting of a large part of their demands as the condition precedent to negotiation. The fundamental issue is whether or not force or reason is to be the accepted basis of adjusting disputes in this basic industry.

"Mr. Lewis' criticism of our acceptance of his proposal of yesterday is without a constructive or conciliatory note, and indicates a determination to avoid a settlement except upon his own terms. His proposal was obviously advanced to avoid a break over the issue of the closed shop with the 'check-off' but when the operators accepted it, he informs them, through the Commission, that the closed shop demand is not abandoned and that he did not intend by this proposal to give a pledge that there would be no strike.



"In view of the present situation, we propose to ask the Commission to state definitely to the public the issues involved in this controversy."

At about the same time, and after several hours conference behind closed doors with the operators, Mr. Hammond authorized a statement to the effect that the Commission was discouraged over the situation.

The air cleared the next day, for on Friday morning the Commission addressed a letter to both Mr. Warriner and to Mr. Lewis asking them to get together as the country needed the coal. Commissioner Smith had previously told the newspaper men that the two parties were writing letters that the other side could not understand and that the Commission could understand neither. The Commission's letter follows:

"The committees appointed respectively by the anthracite operators and mine workers to negotiate a new contract to replace the existing one which expires Sept. 1, have been in complete deadlock since July 27, and from that date until Aug. 14 not even a meeting was held in an effort to negotiate a new agreement.

"Now more than two days have been spent in a fruitless effort to find a basis upon which to bring about a resumption of negotiations, and in the exchange of notes between the parties thereto, through the medium of the commission, it has been found impossible to have the language of those notes construed to mean the same thing to both of the parties.

"There now remain only fourteen days before the present contract expires. The public mind, with a keen realization of the suffering of last winter because of an inadequate supply of anthracite is beginning to be seriously alarmed over the question of whether there is to be another suspension of anthracite mining on Sept. 1 of this year.

"It is imperative that this uncertainty be cleared up at once. We therefore urge that the representatives of the two sides enter into a conference to consider and report to us:

"(1) Whether you can reach an agreement over the matters now in dispute and negotiate a new agreement by Sept. 1.

"(2) Whether, in the event of your inability by Sept. 1 to reach agreement upon the matters in controversy, you can agree on a plan that will assure a continuance of mining after Sept. 1 and until you have reached an agreement.

"(3) Whether, in the event that you find yourselves unable to reach a complete agreement upon the matters in controversy, you can agree upon some plan for an orderly and peaceable settlement of the matters in controversy on which an agreement cannot be reached by contract negotiations, and thus prevent a suspension of mining as a result of the present controversy.

"The Commission asks that you go into joint session immediately and reply in writing by 8 o'clock to-night."

#### BOTH SIDES PROMPTLY AGREE TO RECONVENE

The response was prompt and to the point. Both sides held executive meetings and then they gathered together as a joint committee with James A. Gorman as their secretary, and shortly after lunch sent forth the word that they had agreed to take matters up in joint conference at Atlantic City on Monday, Aug. 20 just where they left off before Lewis issued his ultimatum on July 26. Their joint letter to the Commission, that sent them all scurrying for the ticket office and home, read as follows:

"The Joint Conference of Anthracite Miners and Operators has directed me to reply to your letter of even date requesting representation of the two sides to immediately enter into a conference, and submitting certain questions, as follows:

(1) In view of the Commission's request, and the public interest and apprehension, the miners and operators will, without prejudice, meet in joint conference Monday next, 11 a.m., at Atlantic City, and will earnestly endeavor to reach an agreement by Sept. 1.

(2) The operators urged that an understanding be reached providing that no suspension take place September 1, in case no agreement is reached by that date, and that the new agreement, when executed, be retroactive to that date. The miners asked that this be left to the joint conference.

(3) The operators urged that the parties agree to arbitrate any part of the eleven demands not otherwise disposed of. The mine workers stated that this subject was superseded by the joint action in agreeing to confer."

### Condemn Effort to Unionize West Virginia; Commission Asked to Inspect Field

Operators of southern West Virginia are unwilling to contract with the organization of United Mine Workers of America, according to a voluminous brief filed Aug. 18 with the U. S. Coal Commission by Colonel Henry L. Stimson and Goldthwaite H. Dorr, counsel for the Bituminous Operators' Special Committee. "Wisely or unwisely, they object to placing their labor relations with their men under the absentee control of the International officers of the United Mine Workers' organization at Indianapolis. They point to strikes called by the central organization in districts in which there was no local dispute. They point to the fact that it was only through the existence of the fields which refused to contract with this organization that the public, as the President told Congress, was saved from being entirely at the mercy of that organization during the 1922 nation-wide strike.

"Wisely or unwisely, they are convinced that contracts with that organization are in the interest neither of the operator nor the miner but tend to stifle efficiency and individual initiative, and to create a relationship based not on mutual confidence and sense of responsibility but on mutual hostility. They point to a 20 per cent loss in productivity per worker in the Fairmont field when it contracted with the organization. They point to an 18 per cent increase in efficiency and 15 per cent increase in miners' earnings in the Kanawha field in the mines which have changed from union to non-union operation.

"They are convinced that to contract with that organization is to put the economic future of their fields which have no local markets at the mercy of wage agreements dictated by the International officers in Indianapolis who have a deep-rooted hostility to this field and whose primary interests are elsewhere. They point to the bitter complaints of the operators in the Kanawha field and the states of the Southwest to the effect that the central organization, through arbitrarily dictating wage scales inapplicable to local conditions, has in effect discriminated against those fields.

"They object to the principle of being compelled to employ only members of that organization and to being forced to collect, by the 'check-off,' for that organization such dues and assessments as it sees fit to impose on each worker in their mines."

Urging the members of the Commission to visit the West Virginia mining regions in person, counsel assert that they will find living conditions that compare favorably with any standard. Tables are adduced to show higher earnings by miners in the non-union fields than in bordering union territory. Nowhere in West Virginia, the brief states, will the commissioners discover any mitigation of the crimes presented in 15,375 pages of West Virginia court records growing out of violence alleged in many cases to have been directly instigated or even directed by responsible officials of the miners' union.

Reviewing the bloody attempt of the United Mine Workers to impose the check-off at Willis Branch, Colonel Stimson and Mr. Dorr declare that after the fighting "fire, dynamite and bullets had made the place practically uninhabitable and had made mining impossible." Hundreds of thousands of dollars in damages, they say, were paid out of court by the United Mine Workers of America rather than to have the resultant damage cases come to trial.

John L. Lewis, president of the miners' union, in reply to the brief made the following "square-toed proposition":

"We challenge the non-union operators of southern West Virginia to remove all restrictions and restraint and permit their employees to join the union if they so desire. The union will present its case to these men in a lawful, peaceable and orderly manner; and let the men themselves determine whether they wish to join.

"Of course, it will be necessary for these non-union

operators to agree in advance that they will eliminate all of their gunmen, hired thugs and armed guards during the time this test is in progress, and that they will not permit these brutal desperadoes to interfere in any manner with the men in the exercise of their discretion. Further, it will be necessary for these non-union operators to pledge their word that they will abandon their practice of discriminating against men who do join the union; that they will not discharge employees who become members of the United Mine Workers as they have done in the past and as they are doing today. Otherwise the test would not be a fair one.

"No member or representative of the United Mine Workers will violate any law or create any disturbance in connection with this test of the unorganized employees. If these non-union operators are game they will accept this challenge. If they are a set of welchers, they will refuse it. It will be interesting to see what they do about it."

### Fireboss' Attempt to Relight Lamp Causes Explosion That Kills 99 at Kemmerer

Ninety-nine coal miners lost their lives and thirty-five survived in an explosion in Frontier Mine No. 1 of the Kemmerer Coal Co., one mile from Kemmerer, Wyo., at 8 o'clock in the morning of Aug. 14. The last sad rites were held over the bodies of the stricken miners Aug. 17.

About the same time the Coroner's jury returned a verdict finding that the blast was the result of an attempt by the fireboss in room 7, off the thirtieth entry, to relight his safety lamp. The lamp, carried by Thomas Roberts, fireboss, whose body was last taken from the mine, was produced at the inquest by Peter Boam, gas watchman. He declared he found the lamp 12 ft. from the face of room No. 7, close to the spot where the body of Roberts was found. The top and bottom were 2 ft. apart and a match apparently recently lighted, with evidences of being burned on the head only, was found a few inches from the bottom part of the lamp, he testified.

P. F. Patterson, state mine inspector, testified that on May 17 he had found the mine in good condition with adequate air.

Joe Nadi and Tony Davich were heroes of the disaster, having locked twenty-seven men within a slope barricade, until the death tunnel on the 1,700 ft. level was partly cleared from blackdamp. Twenty-two of this number were rescued alive. The explosion occurred between slopes 15 and 17, about a mile from the entrance of the mine. A cave-in on the 1,700 ft. level soon after the explosion and the bursting of a water main greatly hampered rescue work.

District Judge John R. Arnold, of Evanston, is at Kemmerer to begin payment of compensation to the survivors of the blast victims, in accordance with the Wyoming law relating to workmen's compensation. The fund will be depleted at least \$200,000 by the blast, he said.

P. J. Quealy, president of the company, is doing everything possible for the survivors and the victims' families. A relief organization has been formed.

### Danger in Check-Off, Says Dr. Eliot

Declaring that the "check-off" demanded by the United Mine Workers of America is illegal and that it would be a violation of the Federal Anti-Trust Law, Dr. Charles W. Eliot, president emeritus of Harvard University, in a letter to the General Committee of Anthracite Operators, says the insistence of the United Mine Workers on the adoption by all coal operators of the "check-off" is "much more than a threat of 'no anthracite' for the American people. It is a declaration of purpose of the United Mine Workers to force the closed shop on all coal operators throughout the country, and through the establishment of the closed shop, control all American industries and the Government itself. Hence the necessity of submitting to the thinking public the operators' reasons for refusing the demand for the check-off."

Dr. Eliot says that the union boldly avows a policy of resorting to a general tie-up all over the country rather than accept arbitration, as the operators have done, in cases where collective bargaining fails to reach an agreement.

"If the operators," he says, "should agree to join the United Mine Workers in creating an ironclad and irresistible monopoly in mining coal, they would not only betray the interests of the entire consuming public but also make themselves violators of the law. They should not violate the law to save themselves from financial loss, and do not propose to do so.

"The closed shop throughout an entire industry has been declared illegal by every high court which has passed upon the matter. As late as June 30, 1923, a federal court said: 'Monopolies are especially intolerable where they concern the basic resource of individual existence, to wit, the capacity to labor. . . . This is an old and familiar doctrine in whose maintenance none have so deep a concern as the poor, the humble and those who live by the labor of their hands.' The Supreme Court of the United States has declared that 'There is no more sacred right of citizenship than the right to pursue unmolested a lawful employment in a lawful manner. It is nothing more nor less than the sacred right to labor.'

"Hence it follows that maintenance of the open shop in the chief American industries, especially those which deal with foods, fuels and transportation, should henceforth be a prime object with every lover of his country and democracy. How little has been accomplished toward the open shop since 1903, when the Roosevelt award forbade discrimination on account of membership or non-membership in a labor union!

"The closed shop also puts into the hands of the unions the power to reduce the volume of production by ordering every worker to 'go slow.' The 'slacking' is the most disastrous practice which has ever found place in the American industries, and presents the most serious danger for their future. It destroys the alertness, energy, self-reliance and sense of responsibility which formerly characterized all American labor, and is inconsistent with the maintenance of individual self-respect."

## Bituminous Coal Loaded Into Vessels at Lake Erie Ports During Season to End of June\*

(In Net Tons)

Ports	Railroads	1923			1922			1921		
		Cargo	Fuel	Total	Cargo	Fuel	Total	Cargo	Fuel	Total
Toledo	Hooking Valley	2,314,486	69,256	2,383,742	1,492,230	36,331	1,528,561	2,349,553	61,521	2,411,074
	N. Y. C.-Ohio Central Lines	817,014	25,428	842,442				646,417	18,206	664,623
	Baltimore & Ohio	1,233,115	36,349	1,269,464	1,649,323	40,916	1,690,239	1,365,697	38,589	1,404,286
Sandusky	Pennsylvania	1,398,824	42,331	1,441,155	975,982	27,879	1,003,861	800,265	22,079	822,344
	Wheeling & Lake Erie	718,221	26,586	744,807	7,612	334	7,946	1,020,112	26,182	1,046,294
Huron	Baltimore & Ohio	1,511,966	86,094	1,598,060	17,820	16,069	33,889	1,594,796	58,398	1,653,194
Lorain	Pennsylvania	906,827	83,495	990,322	44,805	22,543	67,348	1,312,504	44,878	1,357,382
Cleveland	Erie	475,844	20,649	496,493				276,161	8,448	284,609
Fairport	Baltimore & Ohio	326,908	32,708	359,616						
Ashabula	New York Central	1,854,363	121,693	1,976,056	31,083	15,391	46,474	817,040	33,595	850,635
Conneaut	Pennsylvania	1,020,053	42,721	1,062,774	30,392	16,708	47,100	1,529,437	48,159	1,577,596
Erie	Bessemer & Lake Erie	1,394,998	98,505	1,493,503	58,139	1,207	59,346	592,120	7,443	599,563
	Pennsylvania	311,596	39,842	351,438	28,607	31,148	59,755	711,560	35,659	747,219
<b>Totals</b>		<b>14,284,215</b>	<b>725,657</b>	<b>15,009,872</b>	<b>4,335,993</b>	<b>208,526</b>	<b>4,544,519</b>	<b>13,015,662</b>	<b>403,157</b>	<b>13,418,819</b>

\* Compiled by Ore & Coal Exchange, Cleveland, Ohio; H. M. Griggs, Manager.



## Coal Commission Optimistic on Wage Parley; to Fix Responsibility if Conferees Fail to Agree

Expressing optimism that resumption of negotiations between the anthracite operators and miners will result in an agreement, so that work in the hard-coal fields may continue without interruption, but asserting that should there be a failure to do so they will report the facts and fix responsibility and make "appropriate" recommendations to the President, members of the U. S. Coal Commission returned to Washington Saturday from their conferences in New York with operators and miners which brought about an agreement to resume negotiations Aug. 20.

While the atmosphere of official Washington is hopeful that the crisis in the anthracite situation has passed and that from the reopened negotiations will come, if not an immediate agreement on all points at issue, at least an arrangement by which work will continue without interruption, spokesmen for the administration have let it be known that plans have been perfected to forward heavy shipments of substitutes for hard coal—bituminous coal and coke—into the anthracite-consuming sections if there be a cessation of operations in the collieries Sept. 1, or at any date.

Although "a cessation of production of any essential commodity cannot be viewed as a pleasant prospect," to use the words of one high government official, and it is realized that to provide substitutes would entail longer railroad hauls in many cases, place a strain upon open-top car supply and create other problems, yet the plan, it is felt, will insure the people and the industries of the anthracite-consuming regions against suffering from cold or a shutdown of plants.

### WADLEIGH TO DIRECT DISTRIBUTION OF SUBSTITUTES

F. R. Wadleigh, Federal Fuel Distributor, will be placed in charge of distribution of substitutes if production of anthracite ceases. The broad powers of the Interstate Commerce Commission will be employed to execute the plan. Mr. Wadleigh's office as Federal Fuel Distributor expires by limitation Sept. 22, but it is pointed out that he can be appointed an agent by the Interstate Commerce Commission, and this will be done if the necessity arises.

For several months Mr. Wadleigh has been making a special study of transportation of coal, and this, added to his broad experience in fuel matters, it is felt by officials, marks him as the logical authority to place the system of distributing anthracite substitutes in operation if that action becomes necessary.

The National Coal Association, through its president, J. C. Brydon, speaking for the bituminous operators, has offered a plan to the government to supply soft coal to the anthracite-consuming areas, with voluntary committees of operators to assist and with traffic experts to aid the distribution, at the same time agreeing in advance to submit to voluntary price-regulation or supervision by the government. The plan in view by the government will be a government plan, but it is highly probable that the offer of the bituminous operators will be accepted in part should occasion arise.

It is evident that in the event of another deadlock between the anthracite miners and operators at Atlantic City the Coal Commission will resort to an appeal to public opinion, through a statement which will attempt to fix in the public mind the responsibility for the condition. The Commission will receive daily reports of the proceedings at the Atlantic City conference.

Immediately after their return from New York, where they had summoned in conference committees representing the hard-coal producers and the workers in those fields, Chairman John Hays Hammond and Dr. George Otis Smith, of the Commission, conferred with President Coolidge, remaining with the chief executive half an hour. They submitted a written report and discussed the subject more intimately than was possible in this document.

Speaking to newspaper men after his conference with the President, Chairman Hammond said: "I don't think that

intelligent men can afford to commit suicide at this time. It would be suicidal for either party to be responsible for the suspension of industry. I have too high a regard for the operators and miners to think they would commit such an egregious error, and yet such things have been."

The text of the report submitted by the Coal Commission to the President follows:

"The U. S. Coal Commission, in the discharge of what is believed to be its function, having obtained knowledge that the conference between the operators and the miners in the anthracite region had come to a deadlock, and that negotiations had been discontinued on the 27th day of July, 1923, and that no steps had been taken by either party to reconvene the conference, requested the parties thereto to appear before the commission at the Pennsylvania Hotel, in the city of New York, upon Wednesday, the 15th day of August, 1923, at 3 o'clock p.m.

"At that date and hour the parties appeared and the commission took up with them in turn in executive session the conditions which caused the deadlock and questions in controversy.

"After two days of continuous examination the commission deemed it advisable to address the following letter to the parties in controversy: [The report here quoted the letters addressed by Chairman Hammond of the Coal Commission to John L. Lewis, representative of the mine workers, and Samuel D. Warriner, representative of the operators, under date of Aug. 17, calling upon them to enter into conference, and addressed by James A. Gorman, secretary of the joint conference, in reply to Mr. Hammond, announcing that the parties to the controversy had agreed to resume conferences at Atlantic City, Aug. 20.]

"The Commission does not believe it is in the public interest or helpful in the negotiations to be resumed at Atlantic City for it to report the details of the statements made by the several parties before it in conference.

"The Commission will keep in constant touch with said negotiations, and has the promise of both parties that it shall be informed day by day by the secretary of the joint conference of the progress made, or attempted to be made, in reaching a solution of the question involved in keeping the mines open.

"The Commission ventures to express the hope that a prompt agreement at Atlantic City may render unnecessary any further report on this subject, but if there shall be a failure to negotiate a new contract at Atlantic City before the 31st day of August or a failure to agree upon some method of keeping the mines open until a new contract shall be agreed upon, the Commission will report the facts, fix what it believes to be the responsibility and make such recommendations to you as under the circumstances and the law it may deem appropriate.

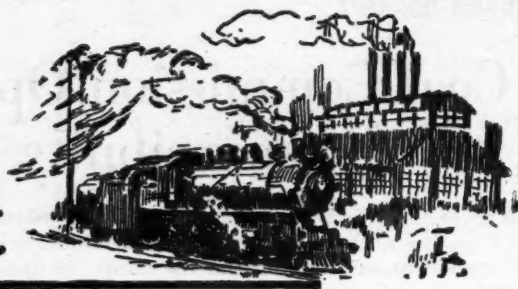
"In the meantime, if the reports received daily from Atlantic City shall lead the commission to the conclusion that an emergency report is necessary, the same will be promptly made."

### Bids Received for Supplying U. S. Army Coal

Thirteen bids were received by the U. S. Shipping Board, New York City, Aug. 13 for furnishing and delivering, f.a.s. vessels of the United States Line, New York harbor, eight months supply of coal, with an alternative of one year's supply. Bidders were privileged to submit prices on Pennsylvania or West Virginia Pool 1 coals, or on coals on the United States Navy acceptable list. Three separate bids were received for furnishing and delivering Pocahontas or New River coals, the prices ranging from \$6.59 to \$7.93 f.o.b. mine. Prices submitted in the remaining ten bids ranged from \$6.29 to \$7.52 per gross ton, or on a basis of about \$3.16 to \$4 per net ton f.o.b. mine. Bidders can be required to supply 15,000 tons per month.



# Production and the Market



## Weekly Review

The market for both bituminous coal and anthracite is sensitive to a marked degree over the anthracite situation. Last Thursday morning it was announced that miners and operators had settled the check-off question and that the danger of the strike on Sept. 1 was averted. Immediately the top level of independent quotations on domestic anthracite dropped a dollar. The same night it was announced that settlement had been upset. The next morning these independent quotations went up 75c.

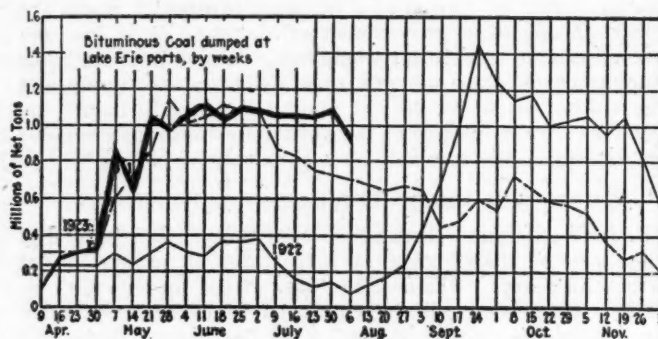
Production of bituminous coal is now nearly 11,000,000 tons per week. An increase of 10 or even 5 per cent in demand would change the situation over night from a buyers' to a sellers' market and inside of two weeks the soft-coal operators would be charging their lost operating time to "car shortage" instead of, as now, to "no market." A strike or the certainty of a strike in the anthracite region would soon throw an added load of from 10 to 20 per cent on the Eastern soft-coal fields that are in position to furnish substitutes for anthracite. Under such circumstances nothing but voluntary action, such as has been promised by the soft coal operators, would serve to keep down the price.

### PRICE INDEX REGISTERS SLIGHT INCREASE

Coal Age Index of spot prices of bituminous coal at the mines gained one point last week and on Aug. 20 was 197, which corresponds to an average price of \$2.38. Throughout the East there has been some buying of soft coal to replace anthracite and a flood of inquiries have been received by the distributors of both coal and coke, particularly those in the Pittsburgh district. Industrial buying has been quiet but regular in the past six weeks and practically all large consumers in New England now have more than 90 days' supply on hand. The railroads on Aug. 1 had 14,000,000 tons of reserve of which more than 11,500,000 was in stockpiles. This exceeds railroad fuel stocks at the end of the war, which

were the highest recorded up to that time. The railroads put 3,500,000 tons of coal in storage in July.

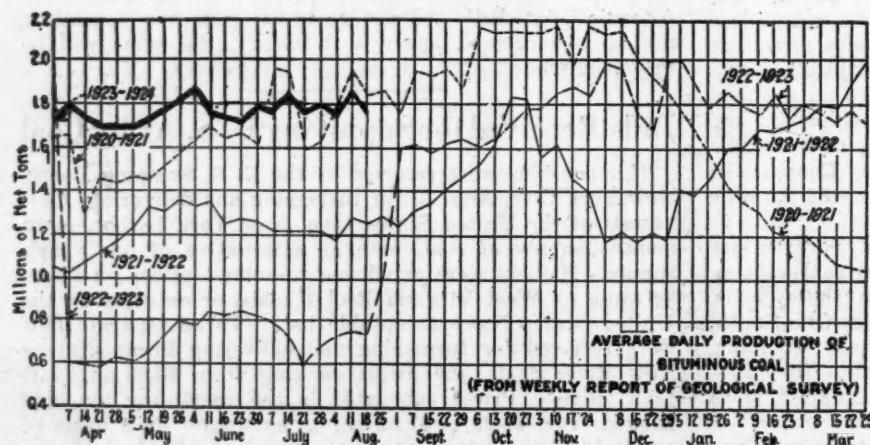
Nearly one-sixth of the total bituminous coal produced in July was used in the manufacture of coke, which goes for the most part to the iron and steel industry. The high production records now being set up in the iron and steel industry account for a large part of the heavy production and consumption of bituminous coal this summer. Because a great deal of coal thus used comes from mines, owned and occupied by the steel producers, the heavy demand from these sources has had no effect on the commercial market.



LAKE COAL DUMPED  
(Net Tons)

	Week Ended Aug. 20	Season to Aug. 20
Cargo .....	935,882	16,955,167
Fuel .....	54,022	859,828
Totals .....	989,904	17,814,995

All-rail shipments of bituminous coal and anthracite continue in heavy volume to New England, the anthracite movement in the first half of August exceeding 8,000 cars and the soft-coal movement exceeding 9,000 cars. In July more than 1,000,000 tons of soft coal was shipped to New England by water, mainly from southern West Virginia via Hampton Roads.



### Estimates of Production

(Net tons)

BITUMINOUS		
	1922	1923
July 28 (b) .....	3,952,000	10,817,000
Aug. 4 (b) .....	4,313,000	10,565,000
Aug. 11 (a) .....	4,606,000	9,978,000
Daily average .....	768,000	1,890,000
Calendar year .....	212,214,000	334,974,000
Daily av. cal. year .....	1,120,000	1,779,000
ANTHRACITE		
July 28 .....	27,000	2,080,000
Aug. 4 .....	29,000	2,018,000
Aug. 11 .....	40,000	1,735,000
Calendar year .....	23,504,000	62,569,000
COKE		
Aug. 4 .....	110,000	345,000
Aug. 11 (a) .....	112,000	327,000
Calendar year .....	3,849,000	12,192,000

(a) Subject to revision. (b) Revised from last report.



Movement of soft coal up the Lakes is at the rate of more than a million tons per week, the total to date being about 2,000,000 tons ahead of 1921, the best year in the last four. Anthracite shipments up the Lakes through the port of Buffalo were 1,747,520 tons for the season up to Aug. 14, as compared with more than 2,300,000 the same date in 1921, which figures refute the charges commonly made that all the anthracite is being sent west this summer.

Anthracite production continues at the high rate of around 2,000,000 net tons per week. The market for steam sizes of anthracite is better than for some time and the entire product, domestic and steam, is moving forward to the consumer as fast as produced.

The production of beehive coke is slowly but surely declining.

### Chicago Hopes for General Improvement

Despite uncertainty due to the hard-coal negotiations conditions in Chicago last week were such as to stimulate

buying in certain quarters and warrant hopes for a general improvement. Prominent factors in the market are of the opinion that should a settlement of the hard-coal controversy be reached without a strike it would not materially affect the undercurrent betterment that is beginning to make itself felt in soft-coal circles.

Domestic sizes showed some improvement, although the general demand is still hesitant and buying by city dealers is not yet up to expectations. Country dealers were very active during the past week. The situation is due to a combination of increased demand, restricted car movement, and the piling up of low-volatile slack.

In southern Illinois screenings are better maintained at \$1.75 than they have been at any time in recent weeks, due to the depletion of surplus stocks which were a bar to an improvement earlier in the summer, and the slowing up of railroad buying. Domestic demand is light in the city, but is registering a steady improvement in the country. Lump in general is held at circular and the tendency toward a 50c. or more shading is less in evidence than it was a week ago.

In Central Illinois conditions are not of the best, although

## Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

Low-Volatile, Eastern					Midwest				
Market	Quoted	Aug. 21 1922	Aug. 6 1923	Aug. 13 1923	Aug. 20 1923†	Market	Quoted	Aug. 21 1922	Aug. 6 1923
Smokeless lump.....	Columbus....	\$6.10	\$5.85	\$5.85	\$5.75@ \$6.00	Franklin, Ill. lump.....	Chicago.....	\$3.65	\$3.90
Smokeless mine run.....	Columbus....	6.00	3.00	3.00	2.75@ 3.25	Franklin, Ill. mine run.....	Chicago.....	2.85	2.85
Smokeless screenings.....	Columbus....	5.90	2.35	2.35	2.25@ 2.50	Franklin, Ill. screenings.....	Chicago.....	1.65	1.65
Smokeless lump.....	Chicago.....	6.85	5.75	5.75	5.50@ 6.00	Central, Ill. lump.....	Chicago.....	2.60	2.60
Smokeless mine run.....	Chicago.....	6.25	2.75	3.00	2.75@ 3.25	Central, Ill. mine run.....	Chicago.....	2.10	2.10
Smokeless lump.....	Cincinnati.....	5.75	5.75	6.00	6.00@ 6.25	Central, Ill. screenings.....	Chicago.....	1.35	1.35
Smokeless mine run.....	Cincinnati.....	5.50	3.25	2.75	2.75@ 3.25	Ind. 4th Vein lump.....	Chicago.....	3.35	3.35
Smokeless screenings.....	Cincinnati.....	5.15	2.85	2.85	2.50@ 3.00	Ind. 4th Vein mine run.....	Chicago.....	2.60	2.60
*Smokeless mine run.....	Boston.....	8.70	5.35	5.60	5.15@ 6.50	Ind. 4th Vein screenings.....	Chicago.....	1.60	1.60
Clearfield mine run.....	Boston.....	7.60	2.35	2.35	2.00@ 2.75	Ind. 5th Vein lump.....	Chicago.....	2.85	2.85
Cambria mine run.....	Boston.....	8.75	3.00	2.85	2.50@ 3.25	Ind. 5th Vein mine run.....	Chicago.....	2.10	2.10
Somerset mine run.....	Boston.....	8.00	2.60	2.60	2.25@ 3.00	Ind. 5th Vein screenings.....	Chicago.....	1.45	1.45
Pool 1 (Navy Standard).....	New York.....		3.25	3.25	2.90@ 3.25	Mt. Olive lump.....	St. Louis.....	3.00	3.00
Pool 1 (Navy Standard).....	Philadelphia.....		3.40	3.45	3.20@ 3.65	Mt. Olive mine run.....	St. Louis.....	2.00	2.00
Pool 1 (Navy Standard).....	Baltimore.....					Mt. Olive screenings.....	St. Louis.....	1.50	1.50
Pool 9 (Super. Low Vol.).....	New York.....	8.00	2.55	2.45	2.35@ 2.75	Standard lump.....	St. Louis.....	2.30	2.40
Pool 9 (Super. Low Vol.).....	Philadelphia.....	8.25	2.60	2.75	2.55@ 3.00	Standard mine run.....	St. Louis.....	1.85	1.85
Pool 9 (Super. Low Vol.).....	Baltimore.....		2.45	2.50	2.50	Standard screenings.....	St. Louis.....	1.05	1.05
Pool 10 (H.Gr. Low Vol.).....	New York.....	7.50	2.25	2.25	2.00@ 2.40	West Ky. lump.....	Louisville.....	6.00	2.25
Pool 10 (H.Gr. Low Vol.).....	Philadelphia.....	8.00	2.25	2.30	2.15@ 2.45	West Ky. mine run.....	Louisville.....	6.00	1.60
Pool 10 (H.Gr. Low Vol.).....	Baltimore.....	7.75	2.25	2.25	2.25	West Ky. screenings.....	Louisville.....	6.00	1.05
Pool 11 (Low Vol.).....	New York.....	6.50	1.80	1.80	1.75@ 2.00	West Ky. lump.....	Chicago.....	6.00	2.10
Pool 11 (Low Vol.).....	Philadelphia.....	7.75	1.95	1.96	1.75@ 2.00	West Ky. mine run.....	Chicago.....	6.00	1.30
Pool 11 (Low Vol.).....	Baltimore.....	7.75	2.00	2.05	1.90				
High-Volatile, Eastern					South and Southwest				
Pool 54-64 (Gas and St.).....	New York.....		1.80	1.75	1.60@ 1.90	Big Seam lump.....	Birmingham.....	4.25	3.50
Pool 54-64 (Gas and St.).....	Philadelphia.....	6.60	1.80	1.85	1.60@ 1.90	Big Seam mine run.....	Birmingham.....	4.25	2.00
Pool 54-64 (Gas and St.).....	Baltimore.....	7.50	1.70	1.75	1.85	Big Seam (washed).....	Birmingham.....	4.25	2.35
Pittsburgh ac'd gas.....	Pittsburgh.....		2.65	2.65	2.75@ 2.90	S. E. Ky. lump.....	Chicago.....	6.15	3.10
Pittsburgh mine run (St.).....	Pittsburgh.....		2.05	2.05	2.00@ 2.15	S. E. Ky. mine run.....	Chicago.....	6.00	1.85
Pittsburgh slack (Gas).....	Pittsburgh.....		1.55	1.55	1.50@ 1.60	S. E. Ky. lump.....	Louisville.....	5.90	2.85
Kanawha lump.....	Columbus.....	6.40	3.00	3.00	2.75@ 3.25	S. E. Ky. mine run.....	Louisville.....	5.75	1.75
Kanawha mine run.....	Columbus.....	6.25	1.85	1.85	1.75@ 2.00	S. E. Ky. screenings.....	Louisville.....	5.65	1.00
Kanawha screenings.....	Columbus.....	6.00	1.05	1.05	1.00@ 1.15	S. E. Ky. lump.....	Cincinnati.....	5.90	3.10
W. Va. lump.....	Cincinnati.....	5.35	3.10	3.00	3.00@ 3.50	S. E. Ky. mine run.....	Cincinnati.....	5.75	1.55
W. Va. Gas mine run.....	Cincinnati.....	5.35	1.60	1.60	1.65@ 1.75	S. E. Ky. screenings.....	Cincinnati.....	5.10	.90
W. Va. Steam mine run.....	Cincinnati.....	5.50	1.60	1.60	1.85@ 1.75	Kansas lump.....	Kansas City.....	4.00	4.00
W. Va. screenings.....	Cincinnati.....	5.10	1.05	1.05	1.00@ 1.15	Kansas mine run.....	Kansas City.....	3.25	3.25
Hoeking lump.....	Columbus.....	6.65	2.75	2.75	2.50@ 3.00	Kansas screenings.....	Kansas City.....	2.60	2.60
Hoeking mine run.....	Columbus.....	6.25	1.85	1.85	1.75@ 2.00				
Hoeking screenings.....	Columbus.....	5.75	1.10	1.10	1.00@ 1.20				
Pitta. No. 8 lump.....	Cleveland.....	6.10	2.55	2.55	2.20@ 3.00				
Pitta. No. 8 mine run.....	Cleveland.....	6.10	1.90	2.05	2.00@ 2.10				
Pitta. No. 8 screenings.....	Cleveland.....	6.10	1.25	1.25	1.10@ 1.30				

\* Gross tons, f.o.b. vessel, Hampton Roads.

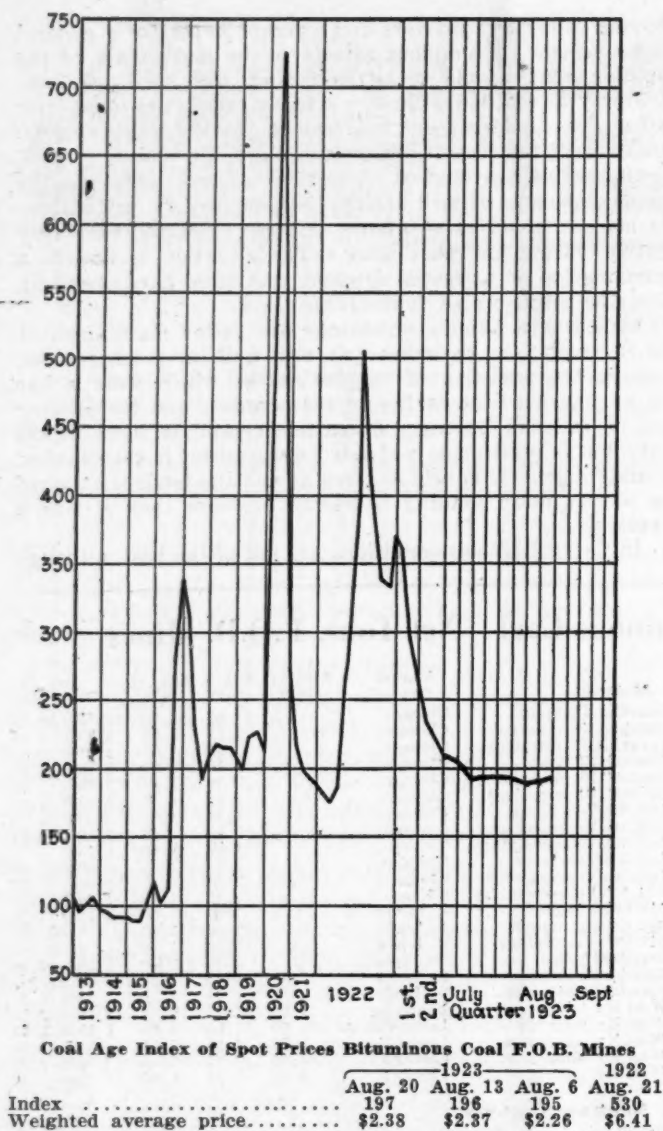
† Advances over previous week shown in heavy type, declines in italics.

## Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

Market		Freight Rates		Dec. 26, 1922		Aug. 13, 1923		Aug. 20, 1923†	
Quoted		Independent	Company	Independent	Company	Independent	Company	Independent	Company
Broken.....	New York.....	\$2.34	\$9.00	\$7.75@ \$8.25	\$7.75@ \$8.35	\$7.75@ \$8.35	\$7.75@ \$8.35	\$7.75@ \$8.35	\$7.75@ \$8.35
Broken.....	Philadelphia.....	2.39		7.90@ 8.10	7.90@ 8.10	7.90@ 8.10	7.90@ 8.10	7.90@ 8.10	7.90@ 8.10
Eg.....	New York.....	2.34	9.25@ 12.00	8.00@ 8.35	8.00@ 8.35	8.00@ 8.35	8.00@ 8.35	8.00@ 8.35	8.00@ 8.35
Eg.....	Philadelphia.....	2.39	9.25@ 11.00	8.10@ 8.35	8.10@ 8.35	8.10@ 8.35	8.10@ 8.35	8.10@ 8.35	8.10@ 8.35
Eg.....	Chicago.....	5.06	12.50@ 13.00	7.20@ 8.25	7.20@ 8.25	7.25@ 7.45	7.25@ 7.45	7.25@ 7.45	7.25@ 7.45
Stove.....	New York.....	2.34	9.25@ 12.00	8.00@ 8.35	8.00@ 8.35	8.00@ 8.35	8.00@ 8.35	8.00@ 8.35	8.00@ 8.35
Stove.....	Philadelphia.....	2.39	9.25@ 11.00	8.15@ 8.35	8.15@ 8.35	8.15@ 8.35	8.15@ 8.35	8.15@ 8.35	8.15@ 8.35
Stove.....	Chicago.....	5.06	12.50@ 13.00	7.35@ 8.25	7.35@ 8.25	7.25@ 7.45	7.25@ 7.45	7.25@ 7.45	7.25@ 7.45
Chestnut.....	New York.....	2.34	9.25@ 12.00	8.00@ 8.35	8.00@ 8.35	8.00@ 8.35	8.00@ 8.35	8.00@ 8.35	8.00@ 8.35
Chestnut.....	Philadelphia.....	2.39	9.25@ 11.00	8.15@ 8.35	8.15@ 8.35	8.15@ 8.35	8.15@ 8.35	8.15@ 8.35	8.15@ 8.35
Chestnut.....	Chicago.....	5.06	12.50@ 13.00	7.35@ 8.35	7.35@ 8.35	7.25@ 7.45	7.25@ 7.45	7.25@ 7.45	7.25@ 7.45
Ranges.....	New York.....	2.34		8.25	8.30	8.30	8.30	8.30	8.30
Pea.....	New York.....	2.22	7.00@ 11.00	6.15@ 6.30	6.15@ 6.30	6.75@ 8.50	6.75@ 8.50	6.75@ 8.50	6.75@ 8.50
Pea.....	Philadelphia.....	2.14	7.00@ 8.00	6.15@ 6.20	6.15@ 6.20	7.00@ 7.50	7.00@ 7.50	7.00@ 7.50	7.00@ 7.50
Pea.....	Chicago.....	4.79	7.00@ 8.00	5.49@ 6.03	5.49@ 6.03	7.00@ 8.50	7.00@ 8.50	7.00@ 8.50	7.00@ 8.50
Buckwheat No. 1.....	New York.....	2.22	4.00@ 5.00	4.00@ 4.10	3.00@ 3.50	3.50@ 4.15	3.00@ 3.50	3.00@ 3.50	3.00@ 3.50
Buckwheat No. 1.....	Philadelphia.....	2.14	5.00	4.00	3.50	3.50	3.50	3.50	3.50
Rice.....	New York.....	2.22	3.00@ 3.25	2.75@ 3.00	2.25@ 2.50	2.50	2.25@ 2.50	2.50	2.50
Rice.....	Philadelphia.....	2.14	2.50@ 2.75	2.75@ 3.00	2.50	2.50	2.50	2.50	2.50
Barley.....	New York.....	2.22	1.75@ 2.00	1.50@ 2.00	1.25@ 1.50	1.50	1.25@ 1.50	1.50	1.50
Barley.....	Philadelphia.....	2.14	1.00@ 1.75	2.00	1.50	1.50	1.50	1.50	1.50
Birdseye.....	New York.....	2.22		2.10		1.60			1.60

\* Net tons, f.o.b. mines.

† Advances over previous week shown in heavy type, declines in italics.



This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the bituminous output of the United States weighted first with respect to the proportions each of slack, prepared and run-of-mine normally shipped, and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke, 1913, 1918," published by the Geological Survey and the War Industries Board.

there is a disposition among distributors to respond to improvement in tone. Indiana reports a stronger demand for domestic sizes from the Fourth Vein with prices inclined to reach a higher level and rule a little firmer on the upper ranges.

A slight increase in orders for domestic coals is noted in the Carterville field, while steam sizes continue quiet. In the Standard district mines are operating  $1\frac{1}{2}$  to  $2\frac{1}{2}$  days a week while there is considerable difficulty being experienced in selling the steam sizes.

#### St. Louis Notes Increased Inquiries

A slight increase in the retail trade has been noted in St. Louis and additional inquiries from consumers indicate that more interest is being shown in their fuel supply. The increased inquiry comes for the high-grade southern Illinois domestic sizes. There is little demand for anthracite, smokeless or coke and since the dealers of St. Louis are known to have a larger supply of anthracite tonnage in proportion to the amount used than other cities, it is not likely to suffer in the event of a suspension of operations in the anthracite fields. There is little demand for anthracite from the country, as most points have been supplied by earlier shipments.

Things continue a "trifle draggy with the western

Kentucky operators and prices on screenings have been a shade weaker, due to better demand and larger production of prepared coal, which is moving north, northwest, central and south. Operators believe that September will bring a better volume of business, and probably better prices. In fact business for September delivery isn't being accepted at present prices by many operators.

#### Movement Better in Louisville Market

Reports in the Louisville market show that movement of coal is better, and that more buyers are entering the field for prepared coal, as well as steam. Movement of prepared coal is now more general, with larger Southern buying, while steam coal demand is taking up screenings quite well at low prices.

Better inquiry is being received from the gas companies, with better utility buying and fair movement to steel and metal-working plants. Railroad buying is not heavy, but consumption on contracts is good. Fair movement to the Lakes has been reported, which is tending toward heavy production of screenings.

Retailers have been buying more freely, as they have about decided that prices are as low as they are likely to go this fall or for some months to come, unless an open winter and good car supply prevail.

#### No Anthracite Arrivals at Duluth

For the first time this year since the opening of navigation no anthracite arrived at the Head-of-the-Lakes during the past week, despite the fact that 50 cargoes of soft coal came in. In the thirty-four cargoes reported on the way from lower lake ports five are hard coal. Official figures of anthracite shipments show that 717,600 tons of hard coal had been received at the docks up to Aug. 1. It is assumed that at least 225,000 tons additional will be received at the docks during August.

One thing which is likely to curtail the use of hard coal at Duluth and also cut down the tonnage necessary is the evident determination of various consumers of hard coal to use substitutes this winter. Total bituminous receipts this year to Aug. 1 are 5,324,400 tons.

Anthracite is being shipped from Duluth to Winnipeg and even to points west of Winnipeg. The Port Arthur and Fort William dealers who usually supply the Winnipeg market complain of being unable to get any anthracite from lower lake ports.

The recent recommendation of the examiner in the I.C.C. hearing on the southern Illinois-Head-of-the-Lakes rate dispute has reassured dock men.

Prices are as follows: Youghiogheny and Hoeking: lump, \$6.25@6.50; run of pile, \$5.25@5.50; screenings, \$3.75@4. Splint: lump, \$6.75; screenings, \$4@4.25. Pocahontas: lump, \$9@10; run of pile, \$6.50; screenings, \$6. Kentucky: lump, \$7.50; run of pile, \$6.75; screenings, \$4@4.25.

#### Active Anthracite Demand at Milwaukee

An active trade in anthracite is the dominant feature of the market at Milwaukee. The yards have plenty of room for hard coal, but soft-coal storage facilities are slowly being exhausted. Soft coal is being taken quite freely, but it is expected that there will be a marked check in receipts by the end of this month unless the outward movement increases. There is some agitation in the newspapers over the fact that the popular grades of anthracite are \$1.70 cheaper at Duluth than at Milwaukee and that ports nearer to Milwaukee also are retailing coal at from 25c. to 50c. per ton less than Milwaukee. Receipts of coal by lake during the first half of August aggregated 78,102 tons of anthracite and 133,036 tons of soft coal, making the cargo receipts since the opening of navigation 531,410 tons of anthracite and 1,681,782 tons of soft coal.

Demand for Kansas and Oklahoma coal, as well as for Arkansas semi-anthracite is beginning to pick up. Reports received by the Southwestern Interstate Coal Operators' Association indicate that the mines are now working an average of three days a week, while a week ago they averaged around two days.

Salt Lake City retail dealers have received many storage orders. Operators report a quiet market, but are optimistic.



### Interest Awakens in Ohio Markets

The trade at Cincinnati is interested in the number of inquiries received last week, although they were not as productive of orders as they might have been. Prices showed more strength. The awakening of interest is attributed to the probability of trouble in the hard-coal fields. Demand for the low-volatile coals continues strong. West Virginia 2-in. lump is quoted at \$2.75, as compared with \$2.50@2.75 last week, and southeastern Kentucky 2-in. lump at \$2.75@3, as compared with last week's quotation of \$2.75.

A slight improvement in the demand for domestic coals at Columbus is reported. Due to better business from the consumer, retail dealers are showing a disposition to buy more, especially Pocahontas, New River and splint varieties. There is a fair demand for the steam coals. Railroads are not taking as large a tonnage as formerly, while public institutions and utilities are taking only a fair tonnage. No change in market conditions is reported from Cleveland. Little storing is being done, most consumers buying as they need the coal.

### Domestic Coal Moving at Pittsburgh

There is no change in general conditions in the Pittsburgh district. Domestic coal is beginning to move with some freedom and the market for good grades is about \$3@3.25. It is estimated at Pittsburgh that about 1,000,000 tons of lake coal remains to be covered. A strengthening of the central Pennsylvania market was noticed at Altoona, more orders being received from Eastern consumers and at somewhat better figures than a week previous. The market at Buffalo remains quiet.

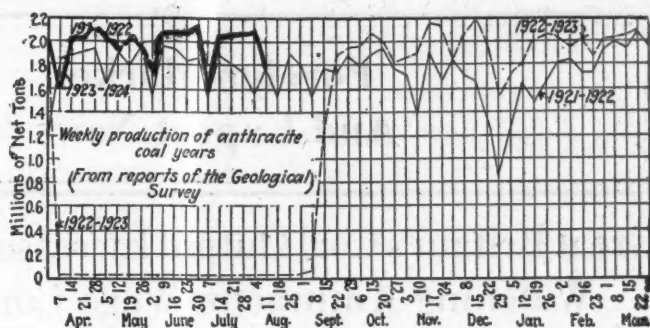
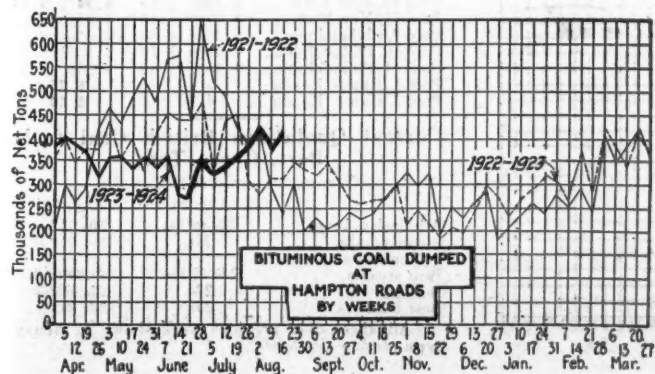
### New England Market Still Apathetic

In New England the market shows no improvement. Buyers continue apathetic and there is so much coal offered that consumers have no idea of increasing their present large reserves. The textile mills in particular have used much less than anticipated, and there are almost no signs of better inquiry ahead.

Hampton Roads prices average lower than a week ago. Quotations still range around \$5.50 per gross ton f.o.b. vessel for No. 1 Navy standard, but a few actual sales have been made as low as \$5.10@5.25. There is practically no distress coal at this end, and for that reason prices on cars at Boston, Providence and Portland are a shade firmer. While Pocahontas and New River have sold at \$6.75 on cars Boston, the prevailing price is now nearer \$7 while certain factors are asking \$7.15.

Receipts all-rail from central Pennsylvania continue on a light basis. Shippers of even the most favorably known grades are actively canvassing for August and September business and prices are down to the cost of production. Prices on the medium and low grades show no change; in fact most of the low-grade operations are shut down until demand improves.

A fair volume is moving via New York and Philadelphia piers, although at New York there are beginning to be accumulations. The actual tonnage dumped this month at the Philadelphia terminals will not compare favorably with tonnage handled in July, but the amount of coal via this route holds up more consistently than coal from the same districts all-rail.



### Buying on Increase in Seaboard Markets

Inquiries for soft coal increased in New York and Philadelphia during the week, and while not much new business developed shippers agreed that buying should increase from now on. There was some expectation among the New York trade that the drawn-out wage negotiations of the anthracite operators and miners would lead to a stronger market. Considerable interest was taken in the prices received by the U. S. Shipping Board on Aug. 13 for supplying coal to the vessels in New York harbor. Efforts made to introduce soft coal as a domestic fuel are not meeting with the success expected. The soft-coal market at Baltimore is quiet, due to a slump in the export trade. Mines in some of the Southern districts, which were damaged by severe wind and rain storms in the middle of August are beginning to recover. There is little demand for high-volatile coal for export. At Birmingham the market remains quiet, though there is a feeling that the trend is toward more activity. Production during the week ended Aug. 4 is reported at 343,000 tons.

The export market is dull. Inquiries have fallen and most of the business now moving is said to be on old orders. During the first twelve days of August four vessels left Baltimore for foreign countries carrying 18,469 tons of cargo and bunker coal.

### Anthracite Market Reacts to Wage Parley

The anthracite market was more or less affected by the favorable impression gained early in the week that the wage negotiations were in a way to early settlement. Some shippers' quotations for independent quotations eased at once only to be partly regained within the next twenty-four hours when the union leaders further explained their offer to the operators. There has been no lessening in demand for domestic coals and steam coals are moving well. The coal fields continue to be thoroughly covered by buyers, who in some cases are bidding against each other. Stove coal continues to be the most desired size, with chestnut a close second. In the New York market egg coal demand is easier and some retail dealers are said to have small tonnages of it, as well as of pea coal, in their bins. Notwithstanding the heavy output retail dealers continue to receive orders, which with the orders already unfilled on their books absorb their receipts rapidly.

A steady demand for anthracite continues to make the hard-coal market at Toronto strong. Although retailers are experiencing no great difficulty in obtaining supplies, anthracite is none too plentiful.

Production of beehive coke continued to decline during the week ended Aug. 11, the Geological Survey reporting the total output to be estimated at 327,000 net tons, a decrease of 18,000 tons as compared with the previous week. The cumulative output of beehive coke during the present year to Aug. 11 stands at 12,192,000 net tons.

### Car Loadings, Surpluses and Shortages

	Cars Loaded		
	All Cars	Coal Cars	
Week ended Aug. 4, 1923.....	1,033,130	190,531	
Previous week.....	1,041,044	194,546	
Same week in 1922.....	842,663	78,965	
	Surplus Cars		Car Shortage
	All Cars	Coal Cars	
Aug. 8, 1923.....	74,168	6,546	10,149
Same date in 1922.....	174,927	131,267	4,897
July 31, 1923.....	76,453	6,546	9,570
			4,774

## Foreign Market And Export News

### Great Britain's Coal Output Increases; Operators Watching Anthracite Wage Conference

Output of coal continues to increase in Great Britain, 5,250,000 tons having been produced during the week ended Aug. 4, says a cable to *Coal Age*. The output for the previous week was 5,112,000 tons.

With the exception of a few of the better grades of large coals, supplies are sufficient to take care of the demand. Mine owners are watching developments in the wage negotiations between the anthracite mine owners and workers.

The Welsh steam coal trade has shown marked improvement. European and Canadian business increased, while the French and Italian railways have sent in bookings for about 400,000 tons of locomotive coals. Some of the best Admiralty mines are definitely out of the market until November. Prices generally are steadier. The anthracite market is good.

Newcastle improved slightly and inquiries increased. German business is slow; France, Italy and Belgium business is quiet and U. S. competition is being felt in the Mediterranean. Contracts reported include Zeebrugge, 12,000 tons best Durham coking; European gasworks, 6,000 tons Wear special gas. Other Continental gasworks are inquiring for quantities ranging from 5,000 tons to 40,000 tons of good gas coals.

#### French Coal Production for June Shows Large Increases

The coal market in France remains favorable, although prices for British and Belgium coals are still high. Supplies of industrial coals are fairly adequate to meet the requirements, while the recent decision of the Belgian Government for the re-establishment of export licenses for house-coals is believed to have caused a large cut in imports. The decision is believed to be due to the excessive prices charged by Belgian collieries. Owing to high prices the marketing of British coals in France has become almost impossible and has caused much uneasiness.

Shipments of coke from the Ruhr received by the S.C.O.F. during July

amounted to about 70,000 tons, as compared with 161,000 tons in June, the decline in the tonnage received being due in part to the bad loading facilities. In order to avoid as much as possible the exhaustion of stocks, the working of some of the coke-oven batteries in the Ruhr is being planned by the French authorities.

Contrary to the assertions made in the German press, the shipping of coal from the Ruhr to Italy has never been stopped, special regulations having lately been fixed by both French and German authorities.

Germany delivered to the Allies during 1922 9,076,000 tons of fuel, while the Commission for Reparations had previously fixed the amount to 11,536,700 tons. Of this amount, France has received 4,247,425 tons of coal, as against 5,308,400 tons fixed by the Commission for Reparations, and 4,340,154 tons of coke, instead of 5,333,300 tons.

The French mines output for June was 3,254,903 tons of coal and 70,813 tons of lignite, as compared with 3,060,061 tons of coal and 79,016 tons of lignite, in May. During the first six months of the year coal production amounted to 18,093,091 tons, as compared with 15,560,400 for the same period of time during 1922.

The total output of coal of the Nord and the Pas-de-Calais for the month of June was 1,785,765 tons, as compared with 1,648,445 in May.

The output in coke during June was 161,130 tons, as compared with 161,943 in May. In the devastated mines of the Nord and Pas-de-Calais, the production of coke in June was 108,149 tons, as compared with 104,740 in May.

There was produced during the first six months of 1923, 882,100 tons of coke, as compared with 464,300 tons for the same period in 1922.

Production of patent fuel during June amounted to 257,793 tons, as compared with 213,000 tons in May, while the devastated mines of the Nord and Pas-de-Calais produced 130,617 tons, as compared with 110,321 tons in May. For

the first six months of the year France produced 1,465,800 tons of patent fuel, as compared with 1,295,200 tons in the first six months of last year.

Production in the Sarre during June amounted to 1,025,716 tons of coal and 11,119 tons of coke.

#### Hampton Roads Market Quiet

Dumpings at Hampton Roads last week increased over those of the previous week, while prices declined slightly. There was some demand for Kanawha gas coals from Canada; but the tonnage was comparatively small. Inquiries from South America were quite numerous, it being stated that British coal agencies not being able to hold this tonnage, a large part of it had been diverted to this port. With the coming of cool weather a better market is looked for.

The large stocks on hand are not causing as much uneasiness among the shippers, as the light demand.

#### Export Clearances, Week Ended Aug. 18, 1923

##### FROM BALTIMORE

For Ecuador:	Tons
Br. SS. Almagro .....	1,657
For Germany:	
Ger. SS. Holstein .....	5,501

##### FROM HAMPTON ROADS

For Brazil:	
Ital. SS. Recca, for Rio de Janeiro....	7,411
For Holland:	
Dut. SS. Burgerdyk, for Rotterdam....	3,833
Ital. SS. Concordia, for Rotterdam....	9,520
For West Indies:	
Am. Schr. Theoline, for Hamilton....	878
Dan. SS. Stal, for Kingston.....	2,165

##### FROM PHILADELPHIA

For Cuba:	
Nor. SS. Lisbeth, for Havana.....	

#### Hampton Roads Pier Situation

N. & W. Piers, Lamberts Pt.:	Aug. 9	Aug. 16
Cars on hand.....	1,692	1,443
Tons on hand.....	93,730	83,024
Tons dumped for week.....	160,964	177,636
Tons waiting.....		1,000

##### Virginian Ry. Piers, Sewalls Pt.:

Cars on hand.....	1,679	2,140
Tons on hand.....	95,691	122,560
Tons dumped for week.....	83,816	75,820
Tons waiting.....	23,805	

##### C. & O. Piers, Newport News:

Cars on hand.....	2,607	1,815
Tons on hand.....	141,285	94,125
Tons dumped for week.....	109,839	110,437
Tons waiting.....	2,115	9,410

#### Pier and Bunker Prices, Gross Tons

	Aug. 11	Aug. 18†
Pool 9, New York.....	\$5.35@5.65	\$5.35@5.75
Pool 10, New York.....	4.90@5.25	5.00@5.25
Pool 11, New York.....	4.65@4.85	4.65@4.85
Pool 9, Philadelphia.....	5.30@5.75	5.30@5.70
Pool 10, Philadelphia.....	4.60@5.35	4.55@5.30
Pool 11, Philadelphia.....	4.15@4.70	4.15@4.75
Pool 1, Hamp. Roads.....	5.10	5.15
Pool 5-6-7, Hamp. Rds.....	4.80	4.90
Pool 2, Hamp. Roads.....	4.90	5.10

##### BUNKERS

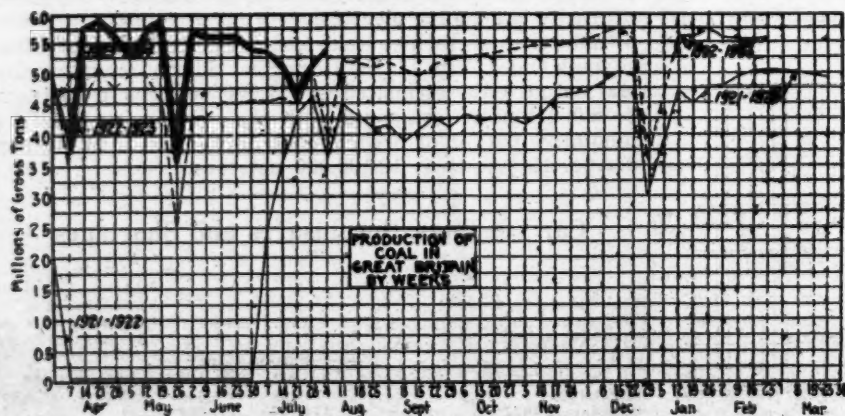
Pool 9, New York.....	5.65@5.95	5.65@6.05
Pool 10, New York.....	5.20@5.55	5.30@5.55
Pool 11, New York.....	4.95@5.15	4.95@5.15
Pool 9, Philadelphia.....	5.70@6.00	5.65@6.00
Pool 10, Philadelphia.....	4.90@5.70	4.90@5.65
Pool 11, Philadelphia.....	4.35@5.00	4.35@5.00
Pool 1, Hamp. Roads.....	5.10	5.25
Pool 2, Hamp. Roads.....	4.90	5.10

#### Current Quotations British Coal f.o.b. Port, Gross Tons

##### Quotations, by Cable to Coal Age

	Aug. 11	Aug. 18†
Admiralty, large.....	30s.@31s.	30s.@31s.
Steam smalls.....	21s.	19s.@20s.
Newcastle:		
Best steams.....	24s.@25s.	22s.6d.@26s.
Best gas.....	27s.	24s.@25s.
Best bunkers.....	25s.	23s.@24s.

† Advances over previous week shown in heavy type, decline in italics.





## News Items From Field and Trade

### ALABAMA

The Federal American Engineering societies have appointed Erskine Ramsay, vice-president of the Pratt Consolidated Coal Co. as chairman of the committee that will make a study of the coal storage problem in Alabama. Other members of the committee are F. B. Keiser, Robert Hamilton, S. L. Morrow, E. Stauverman, E. H. Pierce and T. H. Aldrich. Questionnaires will be sent out to consumers and producers and an effort will be made to compile the data necessary for an early report.

William Lacey, superintendent of mines for the Woodward Iron Co. has tendered his resignation and accepted an appointment in like capacity with the DeBardeleben Coal Corporation. Mr. Lacey for the past two years has been in charge of both the coal and ore mines of the Woodward Company. W. M. Johnson will succeed Mr. Lacey.

The largest class in the history of the mining industry in Alabama took the recent mid-year examination before the state board of examiners. There were 119 applicants for certificates of competency as mine foremen and fire bosses, out of which a total of eighty were successful in passing the examination. Sixty-four received certificates as first class mine foremen, seven as second class, and nine were successful in obtaining certificates as fire boss.

The Riley & Kincaid Coal Co., with capital stock of \$5,000, and the Morrison Coal Company, with \$2,000 capital, were incorporated recently in Jefferson county.

### COLORADO

The American Continuous Retort Co. of Denver has bought a quarter-section of coal land from U. H. Clark of Thompsons located near that place. The price was \$15,000. The Colorado concern will use the output for its own use. The mine has been operated for several years and the coal disposed of in Grand County.

Papers have been drawn for a lease of 6,100 acres of Colorado coal lands to the Pacific Steel Co. of Los Angeles. State house officials reported that the lease would be signed shortly, thereby giving a clear road for extensive exploitation of what is known as the Fort Lewis mesa in La Plata County near Durango where coal lands are located.

A representative of the company has appeared before the state land board and also the state board of agriculture. The latter has control of the mesa. He told the board that 1,000 tons of coal daily could be taken from the field. The Pacific Steel company says it is prepared to spend \$2,000,000 in the development of the new coal fields. The plan is to build a railroad into the mesa country—possibly a branch of the Santa Fe.

### ILLINOIS

The Cosgrove-Meehan Coal Co. of Illinois, at Marion, has increased its capital from \$1,500,000 to \$1,800,000.

The McLean County Coal Company, Bloomington, has resumed operations, work being done on the second vein. The third vein was abandoned several years ago. The company will operate the mine after September 1 at full capacity.

A new 1,000-foot switch is being constructed at the Benton mine of the Franklin County Mining Co. to connect that mine with the Chicago & Eastern Illinois railroad thus giving the mine a second rail outlet. James Seymour is general manager.

Mine No. 5 of the Southern Gem Coal Corporation located at Pinckneyville, will be reopened at once. The shaft was closed sometime ago when the men called a strike over the hoisting engineer, whose discharge the miners demanded. The company refused. The company operates two mines at Pinckneyville, Nos. 5 and 6.

The Kolb Coal Company, one of the leading companies in the Fifth & Ninth Districts of Illinois has just been acquired by Louis C. Emmons, of Philadelphia, who is also President of the Emmons Coal Mining Company, operating mines in Pennsylvania and West Virginia. Mr. Emmons becomes President succeeding C. C. Field. H. B.

Wessel has been promoted from Sales Manager to the office of Vice President, in charge of both the St. Louis office and the company's five mines.

The East Side Coal Co., of Freeburg, a new concern, announces that it is about ready to open its new mine at that place. The following are members of the new concern: Erwin and Edwin Koesterer, Jake and Edward Martin and Leo Funk. The shaft has been completed at a depth of 160 feet and development work is under way. The coal is of excellent quality and averages 6 feet, 8 inches in thickness.

### INDIANA

The Joy Machine Co., a Delaware corporation, has qualified to do business in Indiana with a capital of \$9,000. They will manufacture coal digging and loading machines. Van Nolan, of Evansville, is their agent.

The Keystone Coal Mining Co. has been incorporated with a capital of \$50,000. They will mine coal, clay and minerals with offices at Linton, Ind. W. T. Suthard, Squire Walters, Andrew Humphreys, C. H. Gregory and J. C. Fritz are directors of the company.

John T. Reed, receiver for the Calcora Coal Co., Terre Haute, has received permission from the court to sell or lease the property of the company clear of all encumbrance. The petition showed that the property of the company is of no value so long as it is encumbered and further alleged that all creditors of the company are willing that the property should be sold in this way. The property is said to be worth in the neighborhood of \$40,000. The receiver's report shows a total disbursement of \$6,781.08.

A survey of the amount of coal in storage in Indianapolis is being made by a committee composed of T. A. Wynne, of the Indianapolis Light and Heat Co.; Carl Fletcher, of the Knox Coal Mining Co.; M. K. Foxworthy, of the Merchants' Heat and Light Co.; Earl Carter, of the Public Service Commission, and R. H. Bennett, of the Industrial Sales Co., on behalf of the Federated American Engineering Societies. Every industry that consumes coal is included in the survey, the committee ascertaining how much coal is in storage now and how much the concern can store against emergencies.

### KENTUCKY

Rainbow Coal Co. has been incorporated in Louisville, with a capital stock of \$25,000, by C. D. Salyers, F. S. Salyers and others.

The Kentucky gubernatorial election this fall can't hurt the coal trade of the state materially, as candidates nominated by both parties are favorable to the coal trade. Alvin W. Barkley, Democratic nominee, from Paducah, Ky., who was arguing for a coal tonnage tax, higher mine property tax, lease tax, etc., was defeated on Aug. 4, by J. C. Cantrell, of Georgetown, a man favorable to the coal and racing interests of the state. Charles I. Dawson, of Barbourville, Republican candidate, comes from the coal country, and is favorable to the coal interests. Nominations have been largely argued as if coal and racing were the two big issues. Regardless of which party receives the election, the feeling in the coal trade is that the next Governor will not be a man who is gunning the coal trade.

### MASSACHUSETTS

The committee of Western Massachusetts engineers appointed to study the coal situation as a part of a national investigation of coal storage, which the Federated American Engineering societies have undertaken, in co-operation with the United States Coal commission and the United States department of commerce, will be headed by Robert E. Newcomb of Worthington Pump & Machinery Company, Holyoke. Other members are A. B. Reynders, Westinghouse Electric and Manufacturing Company, Springfield; Herbert A. Moody, Turners Falls Power and Electric Company, Turner Falls; John M. Newton,

Roland T. Oakes Company, Holyoke; Harley W. Morrill, Ludlow Manufacturing Associates, Ludlow; Lorenzo J. Scott, United Electric Light Company, Springfield.

### MINNESOTA

W. H. Hoyt, chief engineer of the D. M. & H. Ry., has been chosen to head the Duluth committee by the Federated American Engineering Societies to study the coal situation. Other members of the committee are W. H. Hawley, G. W. Andrews, W. H. Cargo, C. A. Graves, C. J. Enger, John A. Jess, C. D. Christie and Thomas D. Hodge.

### MISSOURI

A 38-in. vein of coal has been struck on the J. W. Barton farm, at Amoret, seventy miles south of Kansas City on the Kansas City Southern Ry., at a depth of 102 feet.

Bids for the St. Louis city contract for approximately 80,000 tons of Standard screenings, which last year was held by the Egyptian Coal & Mining Co., of St. Louis, were recently opened. The Meteor Coal Co., of St. Louis, was low at \$1.30. The West Virginia Coal Co. came next with a price of \$1.37.

The Kolb Coal Co. of St. Louis, sold under the hammer recently and bought in by the First National Bank of St. Louis representing Philadelphia capitalists who were the bondholders, has been reorganized with Louis C. Emmons, president, of Philadelphia, who is also connected with the E. C. Emmons Coal Co., H. B. Wessels of St. Louis, vice-president and general manager, and Charles Morris, secretary and treasurer.

The property of the Morton Coal Co., operators of Mine No. 24, near Novinger, was sold recently by Sheriff Waddill, of Adair County. The leases were obtained by J. J. McGraw.

### MONTANA

It is estimated that the new Rosebud coal field to be opened by the Northern Pacific Ry. in Rosebud County bears a vein 28 ft. thick and contains an estimated total of 11,550,000,000 tons. The road told the I. C. C. before the commission granted permission for 31 miles of railroad to tap the region, that about 1,400,000 tons will be mined annually for the road's use, saving possibly \$1,000,000 a year over coal of admittedly better quality which the line has been buying for its lines between Mandan, N. D., and Missoula, Mont. No commercial development in the field is planned yet, but the railroad believes that some revenue coal eventually will be produced.

### NEW YORK

It has been announced that Frederick McCann, President of McCann-Camp Company of New York, with offices at Scranton, Pa., DuBois, Pa., and Morgantown, W. Va., has disposed of his interest in Producers Coal & Coke Company of Johnstown, Pa., and is now concentrating his efforts entirely to McCann-Camp Company.

The Board of Directors of the Coal & Iron National Bank, New York City, appointed Harold C. Knapp of the Irving National Bank Trust Officer. Mr. Knapp will take up his new duties Sept. 1st, succeeding Arthur A. G. Luders who has resigned. At the same time John R. Voorhis, Jr., was appointed Assistant Cashier, the appointment to take effect immediately.

Pattison & Bowns, of New York City, announce that they have negotiated a contract for the purchase for a period of years of the entire tonnage of the famous Pittston coal of the Pennsylvania Coal Company, The Hillside Coal & Iron Company and associated companies, to be sold commercially in Canada and the territory east of the western boundary of Pennsylvania, to take effect as of April 1, 1924. They are negotiating with Williams & Peters to take over their sales contract which expires as of April 1, 1924, and upon the completion of these negotiations, an announcement will be made of a definite date when this arrangement will be effective.

### OHIO

H. C. Cain, purchasing agent for Columbus, has awarded the contract for 22,650 tons of nut, pea and slack coal for various city departments at an average cost at the mines of \$1.30 per ton. The Jay Miller Coal Co. will furnish 12,500 tons for the municipal light plant at \$1.40; the Williams S. Harmon Coal Co. will furnish 6,800 tons at the water works pumping station at \$1.24, and the Hixsylvania Coal Co. will furnish 3,350 tons for the garbage reduction plant at \$1.25.



The Clear Creek Coal Company has been placed in voluntary bankruptcy. Its assets are in the neighborhood of \$2,500 and liabilities about \$6,000.

The H. Tahl Co., has been chartered with a capital of \$5,000 to deal in coal, among other things. Incorporators are: Rebecca Tahl, Hyman Tahl, S. Tahl, B. R. Shawman and R. E. Marra.

Development of about 700 acres of coal land in Pultney and Pease townships, Belmont county, Ohio, is contemplated by Fether Hamilton, following the acquisition of the acreage. Coal in this acreage is in the Pittsburg No. 8-A vein. The 700 acres acquired involved a consideration of about \$25,000, it is stated.

The Swaywood Coal Company has been incorporated under the Ohio laws with offices in Cincinnati. Those back of the venture are: G. W. Swain and Miss G. R. Wood, who were employees of the Main Island Creek Coal Company when that branch office was directed by E. J. Frechtling.

Deeds have been recorded at St. Clairsville transferring 800 acres of Pittsburg or No. 8-A coal in Pultney township, Belmont Co. to David Hamilton of Greensburg, Pa. Although the price is given in the deed as \$10 for the entire tract, the revenue stamps on the document indicate the price was \$60,000 or an average of \$75 an acre. This is believed to be the largest price ever paid in the Eastern Ohio field for the thinner vein.

Southern Ohio Coal Exchange reports that during the week ended July 28 there were 153,717 tons produced in the district out of a full time capacity of 722,915 tons from 443 mines reporting. Of the shortage of 569,198 tons, car shortage caused a loss of 9,860 tons; labor shortage a loss of 10,408 tons; strikes, 14,145 tons; mine disability, 6,378 tons, and no market, 528,407 tons. During the same week the eastern Ohio field loaded 11,182 cars out of a total of 15,792 cars ordered.

The Raven Coal Mining Co., of Steubenville, has been incorporated with a capital stock of \$300,000 by Lee Van Tilburg, John H. Peterson, R. D. Stone, E. M. Morrow and M. H. Francis.

The Willard Coal Co., of Cleveland, has sold to the Brocas Chemical Co. a tract of coal land containing 1,000 acres near Racine which will be developed soon by the opening of several mines. The deal involved about \$1,000,000.

The Big Mountain Coal Co., of Columbus, has been made exclusive sales agents for the Vulcan Coal Co., with headquarters in Steubenville and three mines at Pomeroy. The company operates a large mine with a capacity of 1,200 tons daily, where prepared sizes are made, and two smaller mines with a daily capacity of 600 tons where mine-run is produced.

## PENNSYLVANIA

The Amend Coal Co., of Greensburg, has contracted with the Roberts & Schaefer Co., Chicago, for a Marcus screen to be installed in its tipple at Newcomer.

The strike in the Somerset county coal fields, which has been in effect since April, 1922, was called off Aug. 14, when John Brophy, president of district No. 2, United Mine Workers, announced that an agreement had been reached between mine officials and local union representatives, in session at Johnstown for two days. Approximately 2,500 miners were involved in the strike.

A state charter has been granted to the South Cambria Coal Company, Johnstown, with a capital of \$5,000. Incorporators: K. C. Ryan and William Ryan, Johnstown, and George S. Vickrey, Salix. A charter was also issued to the Breck Fuel Company, Pittsburgh, with a capital of \$25,000; incorporators: George D. Breck, Jr., Pittsburgh; Greer McIlvain and Frank G. Thompson, of Dermont.

Graham Bright, general engineer in charge of coal and metal mining department of the Westinghouse Electric & Manufacturing Co., has joined the firm of Howard N. Eavenson & Associates, mining engineers, Pittsburgh, Pa. Mr. Bright will give special attention to power house systems, power plant appraisals, transportation and transmission systems for coal and metal mines and general industrial power applications.

The Bureau of Workmen's Compensation of the State Department of Labor and Industry reports that of the total of 221 fatal accidents that occurred in the industries of Pennsylvania during July, 107 occurred in the mines. Of the other fatalities seventy-three are listed as industrial and forty-one as public service. Fifty-seven of the mine deaths occurred at the anthracite opera-

tions and fifty at the bituminous mines. Luzerne led with the greatest number of any of the coal counties, having nineteen, while Lackawanna and Schuylkill each reported thirteen deaths.

There will be offered at public sale on September 25 in Pottsville, by the Lehigh Coal and Navigation Co., all its rights, title and interest in 582 acres of coal, with 104 acres of overlying surface, located partly in and eastwardly from Pottsville. The property will be sold to the highest bidder whose bid exceeds the sum of \$1,200 an acre for the entire acreage.

Since the inception of the Workmen's Compensation act, Jan. 1, 1916, there have been 19,553 fatal accident reports received by the Bureau of Workmen's Compensation; 3,850 cases of permanent disability; 1,377,303 cases of temporary disability; 15,248 agreements approved in fatal cases; 8,878 approved in permanent disability cases, and 473,480 approved in temporary disability. The total compensation paid during this period, to Aug. 1, this year, amounted to \$45,980,264. The compensation awarded for fatal accidents amounted to \$40,826,405, and of this amount \$13,776,106 has been paid, while in addition \$32,204,158 has been paid in disability compensation.

Shipments of anthracite for the month of July, as reported to the Anthracite Bureau of Information, Philadelphia, amounted to 6,260,053 gross tons as compared with 6,634,787 tons during the preceding month of June, a decrease of 374,734 tons, or 5.6 per cent. The decrease was due to Independence Day celebrations, and the fact that there were five Sundays in July, reducing the working days to twenty-five against twenty-six in June. July shipments show an increase over the same month in 1921, when 5,462,760 tons were shipped, of 797,293 tons, or 14.6 per cent. The July shipments this year were about 535,000 tons above the average shipments for that month in recent normal years. Shipments by originating carriers were as follows:

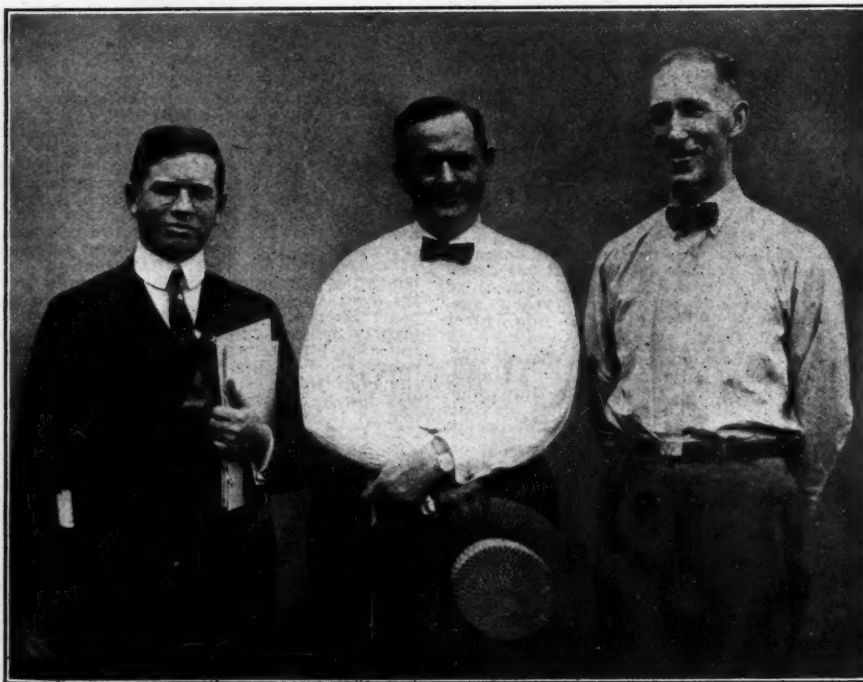
	July, 1923	June, 1923
Philadelphia & Reading .....	1,155,701	1,165,468
Lehigh Valley .....	1,124,400	1,188,497
Central Railroad of N. J. ....	494,254	563,304
Dela., Lack., & Western .....	965,446	1,009,505
Delaware & Hudson ..	879,772	961,703
Pennsylvania .....	520,423	556,291
Erie .....	661,120	690,172
N. Y., Ont. & Western	152,543	162,353
Lehigh & New England .....	306,394	337,494
	6,260,053	6,634,787

The Workmen's Compensation Board has sustained the appeal of the Philadelphia & Reading Coal and Iron Co. in the case of Mrs. Anna Smith, Mt. Carmel. The woman had been granted compensation by the referee for the death of her husband, William E. Smith, but the Board in an opinion writ-

ten by Paul W. Houck, Commissioner, and concurred in by Chairman Walnut and Commissioner Morrison, reaches the conclusion that the referee's findings in the case are not supported by competent proof and that his award cannot be sustained. The referee found that Smith died Aug. 24, 1921, from acute myocarditis, superinduced by a strain sustained while in the course of his employment with the defendant company, Aug. 20, 1921. No person saw the accident and the only proof offered at the hearing was hearsay. The medical testimony showed that the death may have been due to numerous causes and that a sudden heavy strain might have caused it.

The referee in the case of Thomas Gowles, Wilkes-Barre, against the Hudson Coal Co., was also reversed by the Board. This case involved an appeal by the defendant from an order of the referee, granting a petition for termination of a compensation agreement. The claimant was injured, a compensation agreement was executed, and after payments had been made, the company petitioned the Board to terminate the agreement, alleging that the claimant had recovered and was able to resume his regular work on April 17, 1922. The referee found that the claimant's total disability ceased Jan. 24, 1922, but that he is still partially disabled. There was no evidence produced by either side to show the extent of the partial disability. The referee in his order directed that payments of compensation for total disability cease and that a supplemental agreement be executed providing for the payment of partial disability compensation. The company's appeal was based on the ground that the order is impossible of performance because the claimant did not show the extent of his partial disability and the referee did not find it. This, it was claimed, would prevent the fixing of terms of any supplemental agreement. Moreover, the defendant company contended that the claimant has fully recovered.

The fourth annual first-aid meet of the Bertha-Consumers Company, Pittsburgh, which was held Aug. 11, was won for the third consecutive time by the team representing the Johnetta mine at Johnetta. The Johnetta score was 94.66%, closely followed by the Jean Mine of Dinsmore, with a score of 93.50%. As a result of its victory, the Johnetta team will represent the Bertha-Consumers Company at the International First-Aid and Mine Rescue Contest which will be held August 27th to 29th at Salt Lake City, Utah. The Johnetta team in 1921 won the Pennsylvania State championship and tied for fourth place in a field of 68 entries at the International meet held in St. Louis that year. The Bertha-Consumers Company has at its twenty mines in Pennsylvania, Ohio, West Virginia and Kentucky 287 men trained in first-aid and 106 men in mine rescue. Teams composed of picked members from nine of the twenty mines competed in this first aid meet which was staged in co-operation with the U. S.



CHIEF JUDGES AT THE BERTHA-CONSUMERS MEET  
Left to Right—D. J. Parker, Dr. A. F. Knoefel, J. A. Cartel



Bureau of Mines. The members of the winning team are: T. L. Hoising, Captain; Robert Bainbridge, Patient, Edward Fitzmaurice, M. J. Fitzmaurice, David McKelvey and Charles Peterson. R. L. Barnaby is superintendent of Johnetta Mine.

### TENNESSEE

Southland Coal Co. has been incorporated in Memphis, with a capital of \$30,000, by J. M. Green, T. D. Hunt and Geo. Coatway. Alvin Owens, mine foreman of the Highland Coal & Lumber Co., has been elected president of Chapter No. 60 of the Joseph A. Holmes Safety Association, just organized at Davidson. W. C. Reeves is secretary.

The suit entered by the Government against the Nashville Industrial Corporation in the Federal Court of the Middle District of Tennessee asking that the contract held by that corporation with the Government covering the sale of the Old Hickory Plant be rescinded, will in no way interfere with the plans of industrialization of Old Hickory, as it is the desire of both the Government, as expressed by First Assistant Attorney General A. T. Seymour, and the Nashville Industrial Corporation that an industrial city be made of this war expenditure. As charges have been made that there was fraud in the sale of the property, it was felt by both litigants that the question should be definitely settled in order that industrialization might proceed with absolute safety to industries intending to locate at this point.

### TEXAS

Saline Coal Co. has been incorporated in Grand Saline, with a capital of \$90,000, by J. S. Brown, J. F. Bailey and J. F. O'Neill. The latter is president and general manager. The company will develop 303 acres and operations will start within ninety days.

### UTAH

The United States land office at Salt Lake City has been directed by the Secretary of the Interior to offer for lease a tract of coal land in Utah containing 760 acres. The land is in Emery county, occupying the plateau rim on the West side of Huntington Canon and is in greater part underlain by the coal measures of the Mesa Verde formation.

C. H. Hotchkiss, Utah Fuel Co., has been chosen chairman of the coal committee of the new shippers board, formed at the state capitol with Thomas E. McKay, president of the Public Utilities Commission, as president. The board will study production, markets, distribution and trade channels of the commodities local to each district, with a view to effecting improvements in trade practices when related to transportation, and promoting a more even distribution of commodities where practicable. It is hoped that the board will ensure proper car service and that Utah will get her pro rata share of empties.

### WEST VIRGINIA

Probably the first coal company in the country to be named for the new president is the Coolidge Coal Co., launched by Fairmont people including Ernest Hutton and W. Nelson Beale of the Hutton-Beale Coal company, Benjamin Franklin Evans, W. D. Evans and A. J. Colborn. The company is capitalized at \$50,000.

The Shenandoah Coal company has been organized with a view to operating in the Logan county field, with a capital stock of \$75,000. Offices of the company are to be at Logan, W. Va. Those interested in the new concern include Paul Barrett, William Frank, Rex Jones, Fred Haislip and R. S. Burton, all of Logan.

The Goodman Manufacturing Co., of Chicago, manufacturers of "Goodman" coal mining machines and electric mine locomotives, have opened a repair and supply department at Huntington, occupying a building designed and erected expressly for their use.

As a result of a survey made by B. & O. Ry. officials of the number of cars to which mines on its various divisions in West Virginia and other coal producing sections are entitled, mine ratings for the various mines have been revised. In many instances the revision has resulted in a reduction of the allotment for mines on some divisions. The new allotment became effective July 16.

A. Spates Brady, president of the Brady and other coal companies of Elkins, escaped

with light injuries in an automobile collision on the Connellsville road, near Uniontown on Aug. 3, when another car in attempting to regain the road, rammed Mr. Brady's car, drove it against a telephone pole and ripped off both the rear wheels.

F. R. Lyon, vice-president of the Consolidation Coal Co., returned on Aug. 1 from a trip abroad.

R. E. Salvati, recently appointed superintendent of mines 15, 16, 17, 18 and 19 of the Island Creek Coal Co., at Holden, was less than a year ago a laborer for the company, having this advantage, however, that he was a graduate of the West Virginia University. He is only 24 years old. Salvati was promoted from laborer, made assistant mine foreman, later appointed assistant superintendent and finally made superintendent of the group of mines already mentioned.

The Dwyer Coal Co., with operations near Coalburg, is opening a new mine near Chapmansville, where it recently acquired about 1,000 acres of coal of excellent quality. The company is building a modern colliery and also attractive quarters for its employees. John G. Dwyer will have charge of the mines.

A new mine is being opened by the Deep Run Co., of Cumberland, Md., in the Elk Garden district of West Virginia, at a cost of approximately \$300,000. Three mines are already in operation. The new mine at the beginning of operations will have an output of about 500 cars a day and that output will be increased as the mine is further developed. The company produces about 300 tons a day at its other mines. All the plants of the company are operated on an open shop basis. C. H. Lantz, of Piedmont, W. Va., is president, and W. R. Nethken, of Cumberland, Md., vice-president of the company.

The law enacted at the last session of the West Virginia legislature, in April, creating the West Virginia School of Mines is now in effect. The new school when established is to contain departments of mining engineering, mining extension, mining geology and chemical engineering, as well as the mining experiment station already authorized by the mining laws of West Virginia. It is to be organized with a suitable staff of instructors and shall have the same rank and standing as the colleges of engineering, law, agriculture, medicine and arts and sciences. The cost of establishing and maintaining the West Virginia School of Mines shall be paid out of an appropriation hereafter to be made by the legislature for such purpose. The governor has been authorized to appoint a committee of five to ascertain where the school may best serve the mining interests of the state and avoid unnecessary duplication of work. The commission is to be composed of one member of the Senate, one member of the House of Delegates and three prominent coal mining men, who shall serve without pay, and is to report whether in its opinion the school shall be carried on as an independent institution or in connection with one or more of the present existing educational institutions of the state. At the time the bill was introduced a movement was launched in Fayette county to have the new school of mines established at Montgomery. It is probable that it will either be established there or in connection with the State University at Morgantown.

Coal Tonnage handled by the Chesapeake & Ohio during July was heavier than at any time in the history of the road, no less than 3,517,000 tons of coal being handled in that period. The nearest approach to that figure was reached in June, 1922, when a total of 3,300,000 tons of coal were transported. Record-breaking loading in July was made possible by an excellent car supply. Increased loading has also been made possible owing to the steps taken to increase transportation facilities in general for coal.

Of 15 teams competing for first honors in the annual first aid and mine rescue contests at Huntington, Aug. 11, two teams representing the Davis Coal & Coke Company carried off first honors. Team No. 6, representing the Davis operation of the company won first place, and team No. 2 representing the Thomas operation, won second honors. Team No. 8 representing the New River Coal Company, of Beckley, took third place. The Davis team won the cash prize of \$150, the State Department of Mines Loving Cup, six Wolf aluminum safety lamps suitably engraved, and will represent West Virginia at the national first aid meet to be held at St. Louis in September. To the Thomas team was awarded a cash prize of \$90 and six Wolf aluminum safety lamps. The contest was conducted by the West Virginia Department of Mines in co-operation with the

Huntington Chamber of Commerce and under the inspection of the United States Bureau of Mines.

### WASHINGTON

The Morton Coal & Coke Co. has purchased the J. H. Bell farm near Morton and has begun shipments of coal over the new suspension bridge and the C. M. & St. P. Ry. to Seattle and the Coast.

### WASHINGTON, D. C.

The Government Relations Committee of the National Coal Association for the coming year is as follows: Walter Barnum, treasurer, Pacific Coast Co., New York; J. G. Bradley, president, Elk River Coal & Lumber Co., Dundon, W. Va.; W. H. Cunningham (chairman), president, Cunningham, Miller & Enslow, Huntington, W. Va.; E. L. Douglass, vice-president, First Creek Mining Co., Cincinnati; Michael Gallagher, general manager, M. A. Hanna Co., Cleveland; W. H. Huff, president, Victor-American Fuel Co., Denver; S. Pemberton-Hutchinson, president, Westmoreland Coal Co., Philadelphia; Sidney J. Jennings, president, U. S. Smelting, Refining & Mining Co., New York; A. J. Maloney, vice-president, Chicago, Wilmington & Franklin Coal Co., Chicago; Isaac T. Mann, president, Pocahontas Fuel Co., Washington, D. C.; W. F. Megeath, president, Roundup Coal Mining Co., Omaha, Neb.; A. M. Ogle, president, Vandalia Coal Co., Terre Haute; J. G. Puterbaugh, president, McAlester Fuel Co., McAlester, Okla.; P. J. Quealy, president, Gunn-Quealy Coal Co., Kemmerer, Wyo.; Frank D. Rash, president, St. Bernard Mining Co., Earlington, Ky.; H. B. Sajkeld, vice-president, Carnegie Coal Co., Pittsburgh; H. N. Taylor, president, U. S. Distributing Corporation, New York; George T. Watson, Consolidation Coal Co., Fairmont, W. Va., and S. L. Yerkes, vice-president, Grider Coal Sales Agency, Birmingham, Ala.

### CANADA

The Hunt Coal Co., Ltd., of London, Ont., has been incorporated with \$100,000 capital by Charles R. Hunt, John I. A. Hunt, James D. Hunt and others.

Quinle Coal & Towing, Ltd., of Toronto, has been incorporated with \$50,000 capital by Frank W. Richardson, Lansing B. Campbell, Wm. C. H. Swinburne and others.

J. A. Ellis vice-chairman of the Ontario Municipal and Ry. Board, is being retained by the new Ferguson Government in Ontario in his capacity as Fuel Controller. He states that a reasonable supply of anthracite is coming into Ontario but not enough to meet the demand and urges consumers to buy liberally this summer.

A Pennsylvania syndicate which has been exploring for coal near Skidegate, Queen Charlotte Islands for more than a year, has traced a three-foot seam for more than two miles. It is now proposed to sink two shafts on the seam, which is almost vertical. The syndicate is building a wharf at Kagan Bay, on which to land the necessary equipment for sinking and later it will be used for shipping coal. The coal is said to be a good grade of semi-anthracite.

The British Empire Steel Corporation reports that its coal production for July amounted to 136,894 tons, as compared with 423,498 tons for July, 1922, the reduction in output being due to the strike. The production of coal for the seven months ending July 31st amounted to 2,959,426 tons, as compared with 2,186,816 tons for the corresponding months of 1922.

It has been suggested to the Canadian coal trade, that Welsh anthracite coal be shipped to Canada in exchange for pit props. Ships carrying the coal to Canada could load pit props for the return journey thus cutting down carrying charges. Wales produces various grades of anthracite and Canada received some low quality last year but shippers of Welsh coal understand now that only the best quality must be shipped to Canada.

Premier Charles A. Dunning, of Saskatchewan, is advocating protection of the Western Canada coal industry against competition from the United States in the same way as the manufacturing industries of Canada are protected.

Unexpected progress is being made in the campaign for the use of coke as a substitute fuel in Canada, according to the statement issued by Charles Camell, Deputy Minister of Mines following a meeting of the Dominion Fuel Board, at Ottawa. The board has been endeavoring to prevail upon the larger cities such as Toronto, Montreal and Quebec to establish plants for the manufacture of coke from soft coal and the utilization of by-products.



## Association Activities

### COLUMBUS COAL BUREAU

The organization of the Columbus Coal Bureau, Columbus, Ohio, composed of producers and distributors, was completed Aug. 6, when the following officers were elected: President, John M. Taylor; vice-president, Jay W. Miller, and secretary-treasurer Thomas C. Collins. It is the purpose to have the prominent men in the coal industry address the members of the Bureau on industrial and economic conditions.

## Obituary

**C. R. Wilson**, president of the International Fuel and Iron Co. of Pittsburgh, died July 27. He was 39 years old, and was a son of the late J. T. Wilson, who at the time of his death, was president of the National Fuel Co.

**John Hoyes McGowan**, president of the John H. McGowan Co., pump manufacturers of Cincinnati, Ohio, died Aug. 6. He was 93 years old, and had been president of the McGowan company since 1852.

**Willis F. McCook**, president of the Pittsburgh Steel Co., died on Aug. 5, aged 73 years. He was senior member of the law firm of McCook & Jarrett. Early in his career Mr. McCook was the legal representative of Henry C. Frick and T. M. Carnegie.

**David Pursglove**, assistant general manager of the Cleveland-Morgantown Coal Company, at Scott's Run died Aug. 11. Mr. Pursglove's death was due to apoplexy, a stroke of which he suffered while engaged in writing a letter to his nephew, Joseph Pursglove of Cleveland, president of the Pursglove Coal Mining Company, as he sat at his desk in the office of the company on Scott's Run. Mr. Pursglove was 68 years of age. He was a native of Ripley, England where at an early age he acquired a knowledge of mining and of English coal mines.

## Publications Received

**Grates, Stokers, Steam Blowers—McClave-Brooks Co.**, Scranton, Pa. Catalogue 8 x 11, describing the McClave mechanical stokers for all grades of bituminous and lignite fuels. Illustrated.

**The Motor Gasoline Surveys of 1920 and 1921.** (Sequel to Bull. 191) by N. A. C. Smith, Bureau of Mines, Washington, D. C. Technical paper 328. Pp. 41; 6 x 9 in.; tables. Includes complete details of analyses of each sample of gasoline collected in four surveys made in 1920 and 1921, with tables and charts showing comparative results and a brief discussion of the variations in quality developed by the surveys.

**Mine Rescue Standards** (A Tentative Study). Prepared by a committee appointed at the International Mine Rescue Standardization Conference, Sept., 1921. Bureau of Mines, Washington, D. C. Technical paper 334. Pp. 43; 6 x 9 in.

**Comparative Tests of By-Product Coke and Other Fuels for House-Heating Boilers**, by Henry Kreislinger, John Blizzard, H. W. Jarrett and J. J. McKitterick, Bureau of Mines, Washington, D. C. Technical paper 315. Pp. 21; 6 x 9 in.; illustrated. Results of tests made to compare by-product coke, bituminous coal and anthracite as fuels for small boilers are given.

## Trade Literature

**Short Cuts to Power Transmission.** Flexible Steel Lacing Co., Chicago, Ill. Pp. 72; 4 x 5 in.; illustrated. This handy little book should prove useful to belt users.

**New Reinforced Concrete Coaling Plants.** Roberts & Schaefer Co., Chicago, Ill. Bulletin No. 52. Pp. 10; 8 x 11 in.; illustrated. Shows views of coaling plants erected for different railroads, also patented "calibrated" measuring feeder, Simplex loader, by the use of which the 4-column bucket tower is eliminated and undercut lever type coaling gates with swivel aprons.

**Chain-Drive Data.** Diamond Chain & Mfg. Co., Indianapolis, Ind. Pp. 14; 4 x 7 in.; illustrated. This loose-leaf booklet contains charts and information on the design and application of roller-chain drives.

A description of the new standard sprocket tooth form approved by the A. S. M. E. is included, as is also a chart which will prove useful in selecting correct chains and sprockets for transmission purposes.

**The Lilly Hoist Controller, Models C and D.** Duro Metal Products Co., Chicago, Ill. Pp. 18; 8 x 11 in.; illustrated. Contains instructions for installing and adjusting on steam, air and electric hoists.

**The Lilly Hoist Controller, Models C and D (Gravity-Electric).** Duro Metal Products Co., Chicago, Ill. Pp. 22; 8 x 11 in.; illustrated. Auxiliary equipment for steam, air and electric mine hoists are described. The book also contains a treatise on causes of accidents.

**Stow Mfg. Co. of Binghamton, N. Y.** has just issued a four-page folder describing and illustrating its motor-driven grinders, buffers, drill and die-sinking tools.

**Erie Upkeep Cost Record Book.** Erie Steam Shovel Co., Erie, Pa. Pp. 71; 5 x 8 in.; illustrated. Contains maintenance costs covering actual repairs and consumed parts of steam shovels, gathered from an upkeep cost contest.

**The Cox Stoker.** Combustion Engineering Corporation, New York City, N. Y. Bulletin CB2. Pp. 7; 8 x 11 in.; illustrated. The burning of small-sized anthracite coals and coke breeze by the Cox stoker is described, and evaporative tests of the stoker over a wide range of capacities are included.

**International Painting Equipment.** International Engineering Corporation, Malden, Mass. Pp. 15; 8 x 11 in.; illustrated. Among the apparatus described are aerograph sprayers, aerograph control, exhaust hoods, exhaust fans, turntables, electric heaters, reflectors, portable compressors and automatic painting machines.

## Traffic News

The railroads set a new record during the last half of July in repairing and turning out 22,200 locomotives. On August 1 there were 11,555 engines in need of repairs, but the carriers had 52,385 serviceable locomotives and 2,550 locomotives in good repair and in storage, awaiting the heavy fall movement of traffic.

**The Coal and Coke Committee, Trunk Line Territory**, announce a hearing at 143 Liberty Street, New York, on Aug. 23, relative to an advance in rates on anthracite coal, buckwheat No. 1 and smaller sizes, from mines on Delaware and Hudson Ry., to stations on New York, Ontario and Western Ry., Rockdale, N. Y., to Edmeston, N. Y., incl. The reason for the proposal is to make rates same as for one line haul.

During the first fifteen days of July the railroads placed in service 8,217 new freight cars which brought the total number of new freight cars installed since January 1, up to 87,457. They also installed from July 1 to July 15, 102 new locomotives, making a total of 2,100 that have been placed in service since January 1. Of the new freight cars placed in service, box cars numbered 35,833; coal cars, 36,048, and refrigerator cars, 10,224, which includes 6,149 placed in service by railroad-owned private refrigerator companies. Railroads on July 15 had on order 94,202 freight cars, of which 41,726 were box cars, 37,135 were coal cars and 10,703 were refrigerator cars. They also had on order on the same day 1,848 new locomotives. Deliveries of new freight cars and locomotives are being made daily.

**W. J. Smith**, of Omaha, Neb., has been appointed district manager of the Car Service Division of the American Railway Association at Omaha, effective August 15. He has been general agent in Omaha for the Chicago and Northwestern Railroad. The territory making up the Omaha district includes the terminals at Council Bluffs and Sioux City, Iowa; the entire states of Nebraska, Wyoming, Colorado and Utah and the state of Idaho exclusive of the Panhandle.

In recognition of his service to the road, the management of the Chesapeake & Ohio has promoted **J. W. Davin**, chairman of the car allotment commission of the Chesapeake & Ohio Ry. for the last two years, to be assistant superintendent of transportation. The appointment, made by A. T. Lowmaster, superintendent of transportation, was with the approval of General Manager J. B. Parrish. Mr. Davin will have his headquarters at Huntington. Announcement has also been made of the appointment of **Ira F. Davis** as chairman of the allotment commission to succeed Mr. Davin. Mr. Davis has been the general manager of the Chesapeake & Ohio fuel mine operation. **H. B. Husband** has been

appointed as general manager of fuel mine operations, succeeding Mr. Davis.

During the last half of July, 9,493 new freight cars were delivered to the railroads and placed in service, which brought the total number of new freight cars placed in service from Jan. 1 to Aug. 1 up to 96,950, according to the Car Service Division of the American Railway Association. Of the new freight cars placed in service during the last half of July, box cars numbered 3,595; coal cars, 3,133; refrigerator cars, including those delivered to railroad-owned private refrigerator companies, 1,846, and stock cars, 226. The railroads had on Aug. 1, this year, 86,716 new freight cars on order with deliveries being made constantly. Of the total number on order, box cars numbered 38,689; coal cars, 34,457; refrigerator cars, 9,299, and stock cars, 2,214. They also had on order on Aug. 1 a total of 1,772 new locomotives.

Class 1 railroads of the United States, in June earned an annual rate of return of 5.47 per cent on their tentative valuation as fixed by the Interstate Commerce Commission for rate making purposes, including additions and betterments up to Jan. 1, 1923. This rate represented a net operating income for the month of \$87,742,000. In the Eastern district the rate earned was 6.39 per cent; the Southern district, 5.78 per cent, and the Western district 4.20 per cent. The same carriers in June last year earned a net operating income of \$76,271,000 which was at the annual rate of return of 4.86 per cent. In May this year the rate was 6.33 per cent. Thirty one Class 1 railroads in June operated at a loss, of which nine were in the Eastern, two in the Southern and twenty in the Western district. Operating revenues of the carriers in June totaled \$541,163,000 an increase of \$69,129,000 or 14.6 per cent over the same month last year, while their operating expenses amounted to \$416,908,000, an increase of \$43,629,267 or 11.7 per cent over June one year ago.

For the first six months this year the net operating income of the Class 1 railroads represented an annual rate of return of 5.64 per cent on their tentative valuation, amounting to \$443,912,000, compared with \$349,069,000 or 4.53 per cent, for the same period in 1922 or an increase of \$94,842,000 over the first half of last year. In the Eastern district for the six months period it was 6.59 per cent or \$240,731,000; Southern district, 6.64 per cent or \$69,916,000; and the Western district, 4.20 per cent, or \$133,265,000. The Interstate Commerce Commission has not tabulated the tentative valuation of the carriers according to the various subdistricts but compilations show the annual rate of return for the first six months this year based on their property investment accounts to have been 4.94 per cent. From Sept. 1, 1920 to July 1, 1923, during which period of thirty-four months the railroads have been operating without any guarantee whatever, the average annual rate of return of the carriers on their tentative valuation has been only 3.94 per cent. For the Eastern district, it was 4.02 per cent; for the Southern district, 4.05 per cent, and for the Western district 3.82 per cent.

## Coming Meetings

**Rocky Mountain Coal Mining Institute** will hold its summer meeting Aug. 27 to 29 at Salt Lake City, Utah, in conjunction with the **International Safety and First-Aid Meet.** Secretary, Benedict Shubart, Denver.

**New York State Coal Merchants' Association** will hold its annual convention on Sept. 10-12 at Sacandaga Park, N. Y. Executive secretary, G. W. F. Woodside, 250 Arkay Building, Albany, N. Y.

**Oklahoma Coal Operators' Association** will hold its annual meeting Sept. 13 at McAlester, Okla. Secretary, A. C. Casey, McAlester, Okla.

**The American Mining Congress** will hold its twenty-sixth annual convention in conjunction with the **National Exposition of Mines and Mining Equipment**, Sept. 24-29, at the Milwaukee Auditorium, Milwaukee. Secretary, J. F. Callbreath, Washington.

**National Safety Council** will hold its twelfth annual safety convention at the Buffalo Statler Hotel, Buffalo, N. Y., Oct. 1-5. Secretary, W. H. Cameron, 163 No. Michigan Ave., Chicago, Ill.

**The West Virginia-Kentucky Association of Mine, Mechanical and Electrical Engineers** will hold its annual meeting Oct. 19-20 at Huntington, W. Va. Secretary-treasurer, Herbert Smith, Robson-Prichard Bldg., Huntington, W. Va.

**Coal Mining Institute of America** will hold its annual meeting Dec. 19, 20 and 21 at Pittsburgh, Pa. Secretary, H. D. Mason, Jr., Chamber of Commerce Building, Pittsburgh, Pa.